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ADDRESS OF CARROLL D. WRIGHT, PRESIDENT OF THE AMERICAN STATISTICAL ASSOCIATION, AT ITS ANNUAL MEETING IN BOSTON, JAN. 17, 1908.

At the meeting of this Association in April last it was decided that at this meeting, and perhaps at successive annual meetings, there should be a presidential address, and the present one is the first of that character.

It is appropriate, therefore, that I should indulge in a brief historical statement concerning the origin and work of the Association.

The Royal Statistical Society of London was founded March 15, 1834, but was not incorporated until Jan. 31, 1887. Whether the founding of the Royal Society inspired the organization of this Association I cannot say, but it is safe to assume that this was the case, for it was only a brief period after the organization of the British institution that a meeting was held at the rooms of the American Education Society, 15 Cornhill, Boston, Nov. 27, 1839, for the purpose of considering the expediency of forming a statistical society. The following persons were present: Hon. Richard Fletcher, Rev. William Coggswell, D.D., Oliver W. B. Peabody, Esq., Register of Probate, John D. Fisher, M.D., and Lemuel Shattuck, Esq. They organized with the Hon. Richard Fletcher as chairman and Lemuel Shattuck, Esq., as secretary.

After discussing the objects for which the meeting was called,

on motion of Rev. Dr. Coggswell it was resolved that it was expedient to form a society to be called the American Statistical Society.

A committee was appointed to prepare a constitution for the government of the society, to be submitted at an adjourned meeting, and all the gentlemen present were made members of that committee.

Dec. 11, 1839, all the gentlemen previously named being present except Mr. Fletcher, a constitution of the American Statistical Society was adopted. The object of the society was stated to be to collect, preserve, and diffuse statistical information in the different departments of human knowledge. After deliberation and discussion it was voted to adopt the constitution, and an adjournment was made until Dec. 18, 1839, when all the gentlemen named were present, together with Hon. Horace Mann, Dr. Samuel G. Howe, and Dr. Jesse Chickering. At this meeting the organization was perfected by the choice of officers, consisting of Hon. Richard Fletcher, President; Henry Lee, Esq., and Bradford Sumner, Esq., Vice-Presidents; Rev. Joseph B. Felt, Recording Secretary; Lemuel Shattuck, Esq., Home Secretary; Joseph E. Worcester, Foreign Secretary; Rev. William Coggswell, D.D., Ebenezer Alden, M.D., Oliver W. B. Peabody, Esq., John P. Bigelow, Esq., Hon. Horace Mann, John D. Fisher, M.D., Professor Bela B. Edwards, Samuel G. Howe, M.D., and Jesse Chickering, M.D., as Counsellors. At the next meeting, Jan. 8, 1840, there appeared the name of Dr. Webb.

It was voted that an application be made to the legislature for an act of incorporation. Feb. 5, 1840, the occasion of the annual meeting of the Association, the formation, progress, and purpose of the society and the public good it might do, if suitably conducted, was discussed by the President.

At this meeting it was voted on motion of the Directors—and I think we can discover the humor underlying this vote—that the name of the society be altered from that of the American Statistical Society to that of the American Statistical Association.

The officers were elected at this annual meeting, and the individual members were proposed as Fellows, Honorary, Corresponding, and Foreign Members.

By an act approved Feb. 5, 1841, the American Statistical Association was incorporated by the legislature of Massachusetts. Thus the new Association, full-fledged and authorized by law, was ready for its work of preserving and diffusing statistical information. It has always adhered to this provision of the act incorporating it. It has not gone into economic or social questions, philosophical or ethical science, but has adhered most rigidly to its statistical objects.

Up to date it has had a continued existence, there never having been a year since its organization that it has not held meetings and had papers of a statistical character, although its proceedings have not been regularly printed. It has had during the whole period of its existence of sixty-nine years but five Presidents: Hon. Richard Fletcher, 1839–45; George C. Shattuck, M.D., 1846–51; Dr. Edward Jarvis, 1852–82; Dr. Francis A. Walker, 1883–96; and the present incumbent, 1897 to date.

Dr. Jarvis served the Association thirty years as its President, and on the election of his successor, Dr. Walker, he was made President Emeritus.

With two exceptions three quarterly meetings, besides the annual meeting, each year were held from 1840 to 1879. Some of the meetings were omitted in some of the years, especially the July meeting, which, beginning in 1881, was omitted regularly. From 1894 on no quarterly meetings were held, with the exception of a special quarterly meeting on April 16, 1897, in memory of President Walker. Since 1899 until the present year no quarterly meetings have been held, but there has been no year in which meetings have been entirely omitted.

The proceedings of the society have not been published regularly. In 1847 the collections of the Association were brought together and printed, entitled Volume I., in three parts. In the first part there appears quite a valuable paper by Professor B. B. Edwards, of the Andover Theological Seminary.

Professor Edwards discussed the history and origin of statistics. There were other papers on the towns of Massachusetts in this first part, with a history of their origin.

Part two contained statistics of population in Massachusetts, prepared by Rev. Joseph B. Felt, while part three, published in 1847, contains statistics of taxation in Massachusetts, including valuation and population. This was also prepared by Mr. Felt, and was one of the first attempts at analysis of statistics by a member of the Association.

So far as I have been able to learn, papers in a desultory way were published from time to time, but no regular collection appeared until what we now know as the New Series, beginning in March, 1888, under the direction of Dr. Davis R. Dewey, and when General Walker was President of the Association. Since then the publications have appeared regularly, and they constitute a collection of exceedingly valuable statistical productions. In fact, I feel warranted in asserting that no statistical society has, on the whole, brought out a more valuable collection of statistical material, and the members of the Association can feel gratified that it has presented to the public so many carefully analyzed topics relating to the science to which we are devoted.

With this brief historical review, it is pertinent to discuss the field of labor of the Association, the condition of public statistics when it was organized, and the opportunity it has had for exerting its influence and for conducting its statistical investigations.

The scope of statistical inquiry when the Association was organized was not only very limited in quantity, but meagre and unsatisfactory in quality. The vehicle of statistical information, the federal census, had not reached encyclopedic proportions. The Association had as its field from which to draw the facts for its analysis the United States census from 1790 to 1840, the Colonial censuses, and those of one or two States, more especially the efforts of the Commonwealth of Massachusetts. A glance at the founders of our Association convinces one immediately that they were men who understood and com-

prehended both analysis and classification; that the analysis and classification of the facts relating to various conditions which surround the human race entered into their great object, and the purpose of social science at large, the chief object of which is to spread the knowledge resulting from the investigations of its movements, that the people may better appreciate and understand their own conditions and aid, by an increased intelligence, in the amelioration of unfavorable features and the eradication of positive evils.

They knew as well as social scientists and statisticians to-day that statistical methods—or statistical science, if you prefer—could evolve laws which should be applied practically to these great objects of social science. They felt that the time had arrived when something should be done outside the mere collection of data. They had an opportunity with the meagre efforts back of them for this purpose.

The United States instituted the national census in 1790. There are three periods to the American census, the Colonial, the Continental, and the Constitutional, or our present period. During the first period the British Board of Trade played an important part in American affairs, and it often attempted enumerations of the people of the colonies, but the census had not then assumed scientific form and definiteness in Europe, and, as would be expected, the results here were very imperfect. Superstition was an obstacle, but without obstacle success could not have been attained in the colonies when the mother country took her first census in 1801, and then so imperfectly that the results were of no immediate value.

During the Continental period, although resolutions in Congress had been introduced, no general enumeration of the population was secured. Various estimates and computations were made from time to time, but they came no nearer accuracy than those made in the Colonial period. It had, however, become clearly settled that there never could be a complete enumeration until the work was done by a central directing authority. It was left to the Constitution to give us first an enumeration

of population and afterwards a national census, primarily for the purpose of apportioning representatives and direct taxes among the several States included within the Union and according to their respective numbers.

This attitude of Congress caused an enumeration of the population in 1790, and from this has grown the national census. Perhaps the most impressive statement relative to this growth relates to the number of inquiries at the first and at later censuses.

At the census of 1790 there was one schedule, containing four inquiries. In 1840, when the American Statistical Association had just been organized, there were two schedules, containing 82 inquiries or details. In 1890, just one hundred years after the first census, there were 233 schedules, containing 13,161 inquiries or details. Reduced in 1900 to 7,476. Of course, in 1790 the 4 queries related to the members of the family, the people only, while in 1890 the inquiries did not apply to one individual, but they were all projected. This was the grand sweep of one hundred years.

In 1810 an attempt was made to collect data relative to manufactures. This was repeated in 1820, omitted in 1830, and taken up again in 1840, and has continued through all censuses since that time, but until 1850 the inquiries as to manufactures amounted to but little.

A start was made in agricultural statistics in 1840, and the work has been continued throughout.

There were Colonial censuses in the colony of Massachusetts in 1754–1765–1776. State censuses were ordered in 1837–1840 and 1850. The regular decennial enumeration of the inhabitants under State authorization was ordered taken in 1855 in connection with the collection of industrial statistics, and this has been taken since then, being the mean between the dates of the federal census. Thus Massachusetts has a census every five years, both of population and of industry. Some other States organized a census on the quinquennial period relative to the United States census, but, like the earlier State censuses of Massachusetts, they were of very little value except in se-

curing the aggregate population for the purpose of legislative representation.

The crudeness of these earlier censuses seems very strange to us, and yet they were creditable efforts on the part of the State governments authorizing the collection and showed a disposition to secure information on which to base conclusions and actions.

The first analytical survey of any of these works, so far as my observation warrants the statement, was by Lemuel Shattuck, the first Secretary of this Association, in a report to a committee of the city council appointed to obtain the census of Boston for the year 1845.

Mr. Shattuck, who drew this report for the committee, indulged in some very sharp criticisms of the federal census, and analyzed in a very creditable way the results of that particular census. Some of the members of the Association—and I regret that I have not been able to find the documents—dealt with the State censuses from time to time, and others, especially Dr. Jarvis, had much to do with inducing the federal government to expand its work, and in 1870 he analyzed some of the statistics of the federal census.

I do not know whether any of you ever knew Dr. Jarvis, but I knew him well, not only through my association with him in this organization, but by his frequent visits to my office to discuss statistical questions. He was very fond of relating some of the amusing things he found in the federal census. On one occasion he found the case of a man something over eighty years of age who had died of teething, and a child a few months old who had died of old age. Of course there was a transposition in the statements, but it amused the old doctor immensely and he never tired of relating the anecdote.

The first census, as I have said, which really amounted to an attempt at scientific work was the federal census of 1850. It was better in some respects than the succeeding one of 1860. In 1870 General Walker was put in charge, and the census of that year was an enormous improvement over that of 1850; but it was just prior to 1880 that General Walker submitted

to Congress a bill providing for the tenth census, and it was through an extension of inquiries of far-reaching importance that the census of 1880 became known as the encyclopedic census of the United States.

It attracted the attention of the leading statisticians all over Europe and gave the United States a position in statistical work that it had never held before. It should be remembered that the United States was then the only government collecting industrial statistics of any kind,—that is, the products of agriculture and manufactures,—and it is to-day the only State in the world that does this character of work.

We hear of industrial censuses in Europe, but they relate only to occupations, although some attempt has been made to secure statistics similar to those collected here. While the British Parliament rejected time and time again a bill relating to statistics of production, as it was feared that much trouble would ensue, yet last year a law was passed for a decennial census of English manufactures, and the work is now in progress.

The United States is therefore the leading country. Its population schedule embraces many more inquiries than that of any other census office, and it expands its work to cover all conceivable valuable data.

The first State censuses to command any attention and which can, by any stretch of terms, be considered as scientific, were those of New York and Massachusetts in 1875. The New York census of that year was a most excellent one. The census of Massachusetts I do not feel at liberty to speak of extensively, but in bulk, anyhow, it surpassed any of the State's previous publications. A small volume had contained the results of previous censuses. It took three volumes to report the census of 1875; four volumes (and thick ones at that) to report the census of 1885, and seven volumes (large quarto) to get the results of the census of 1895; and I do not know how many volumes it will take to cover the work of the census of 1905,—they are not out yet.

The Association had at its start, as I have said, a very narrow field from which to gather its material. We did not have our

fine registration reports, nothing on agriculture, nothing on insurance, nothing on savings-banks, nothing except the meagre census reports to which I have alluded.

Mr. Felt in his paper to which I have referred, and which was delivered before the Association in 1843, gave a brief account of what was being done at that time in foreign countries. He speaks of the Royal Statistical Society as having been founded in 1834 in pursuance of a recommendation of the British Association for the Advancement of Science. But it could not deal with the great questions which belonged to it. It had little or no information on which to base its conclusions. In fact, I have wondered many times how writers back of 1850 at least could bring out their positive deductions, as Adam Smith, for instance, when he wrote his "Wealth of Nations," seems to have had a vast amount of information, but where he got it is difficult to say.

And so it was all along the line. The Royal Society undertook to meet this great want. It appointed committees for the purpose of procuring and collecting information in respect to various strikes and combinations which existed for the purpose of altering the rate of wages. And it had a committee whose sole duty was to perfect the statistics of life, relating to births, deaths, marriages, and population.

Mr. Felt says that "in the United States but little attention has as yet been given to the subject of statistics, that the attempt has never been made to present a complete view of either of the great departments of this interesting and practical science." He refers to the meagre attempts of the Patent Office and to some of the individual States, the reports of the School Commissioners of New York and Massachusetts, and to a few isolated individuals who have labored in the statistical field with great assiduity. They had to fall back largely on information contained in Warden's "Statistical, Political, and Historical Account of the United States," Timothy Pitkin's "Statistical View of the Commerce of the United States," Adam Seybert's "Statistical Annals," William Darby's "Historical, Geographical, and Statistical View of the United States," and

Watterston and Van Zandt's "Tabular Statistical Views." And he goes on to say that "it is in this interesting and comparatively uncultivated field that the American Statistical Association propose to labor with such means as may be placed at their disposal, with the co-operation of kindred societies which may be formed, and with the aid which may be expected from our National and State governments. It is obviously a field of vast extent, and rich in materials for collection and comparison."

And yet we see how meagre the field was; how rich it is to-day in comparison with what it was when our Association was organized.

But the field has been enriched in various lines other than census taking. While the census offers the greatest field for exploitation by associations like our own, there are other fields now that were not contemplated by the organizers of this institution.

Every State publishes annually a great number of statistical works. These comprehend the statistics of the great elements of business and industrial and social life. A student who undertakes to examine any line of State statistical works finds himself involved in a mass of facts and deductions almost impossible to analyze or classify. As the States have grown, their interests have expanded, and these interests have demanded the facts relative to State activities. So we have statistics of insanity, pauperism, insurance, banking, railroads, great manufactures, statistics of everything, in fact, that relate to the activities of the people,—births, deaths, marriages, and now divorce,—everything, as I have said, that relates to the activities and social environment of the people.

The federal government, in addition to the work of its census, sends out every year numerous volumes containing the most valuable statistical information on the finances of the country, immigration, shipping, the carrying trade, commerce, Indians, and patents, and many other lines of important statistical information.

In 1869 there was instituted here in Massachusetts a new

era of statistical work. This came through the establishment by the legislature of the Bureau of Statistics of Labor. After a few years of work other States established similar offices, often with different designations, but, as a rule, under a law providing substantially what the law of Massachusetts provided for the Bureau of Statistics of Labor. There is now a chain of these bureaus extending from one end of the country to the other, numbering, I believe, 34 offices, while in 1884 the federal government established a similar office which was organized in 1885.

As near as I can calculate, the reports of this chain of bureaus number something like seven hundred volumes, and they constitute a vast storehouse of social and industrial information, some of the volumes not very good, but most of them of an excellent character. They here and there show the lack of a power of analysis and classification, but on the whole, with one or two exceptions, they are honest reports. And I think, too, there has been but one spirit pervading the heads of this great chain of offices. That spirit has dominated the work everywhere, and even when the head of such an office has been appointed for purely political reasons the incumbent has soon realized the sacredness of his office and he has learned that to tell a statistical lie is the most harmful thing a man can do. He becomes inspired with the idea that he must tell the truth.

In this connection I cannot deprive myself the pleasure of relating an experience of mine. I took charge of the Massachusetts Bureau in June, 1873, and on doing so I sought the advice of General Francis A. Walker, adopting for my guide the sentiments contained in his reply, and I believe I can do a service by quoting it in full:—

Dear Sirs,—I have given much thought to the letter in which you do me the honor to ask me my views as to the work of the Massachusetts Bureau of Labor Statistics; but, as the result, I find but little to say beyond expressing my hearty sympathy with the purposes of your office and my wishes for its success. I feel the strongest confidence that the Commonwealth is prepared for your work, and that the work can be done to the satisfaction of all citizens; and that your office has only to

prove itself alike superior to partisan dictation and to the seductions of theory in order to command the cordial support of the press and of the body of citizens. If any mistake is more likely than others to be committed in such a critical position, it is to undertake to recognize both parties as parties, and to award so much in due turn to each. This course almost inevitably leads to jealousy and dissatisfaction. If an office is strong enough simply to consider the body of citizens and to refuse to recognize or entertain consideration of parties, success is already in the main assured. Public confidence once given, the choice of agencies, the selection of inquiries to be propounded, are easy and plain. The country is hungry for information; everything of a statistical character or even of a statistical appearance is taken up with an eagerness that is almost pathetic; the community have not yet learned to be half sceptical and critical enough in respect to such statements. All this is favorable to such laudable efforts as you are engaged in, for the difficulty of collecting statistics in a new country requires much indulgence; and I have strong hopes that you will so distinctly and decisively disconnect the Massachusetts Bureau of Labor Statistics from politics, from dependence on organizations, whether of workingmen or of employers, and from the support of economical theories, individual views, or class interests—as to command the moral support of the whole body of citizens and to receive the co-operation of all men of all occupations and of all degrees, without reference, however, either to their degrees or their occupations.

The time had arrived when the public was, as General Walker states, hungry for statistical information and adopted it pathetically. I think it was this attitude of the public that enabled this great chain of bureaus to meet with success. The rigid and religious observance of his precepts enabled the Massachusetts Bureau to set an example followed, as I have said, by thirty-four States and the federal government, and now it has been followed by every civilized country in the world. I do not think of any government that has not established a bureau founded on the lines of the original Massachusetts office.

And yet it was something different from hunger for statistical information that caused the Massachusetts office to be established. In the legislature of that year—1869—there were petitions for the incorporation of the Knights of St. Crispin. The petitioners were given leave to withdraw.

There had been for three or four years recommendations by

one commission after another for the establishment of a bureau whose sole duty it should be to collect statistics relating to industrial conditions, etc. Nothing had come of them. The rejection of the petition of the Knights of St. Crispin caused the members of the legislature towards the end of its session to become aware of the fact that a political mistake had been made. They could not take up the petition again very well and incorporate the Knights of St. Crispin, so all at once a bill was introduced providing for the establishment of a Bureau of Statistics of Labor, and this bill was carried through very promptly and rapidly under a suspension of the rules, the members of the prevailing party in the legislature having an idea that by doing this they would appease the labor element, especially the Knights of St. Crispin, which was very strong in those days. The result politically was not satisfactory, but by this action the legislature of Massachusetts set the pace by feeding this hunger and appeasing the pathetic appeal for statistical information.

What constitutes the great difference between the statistics of the present time and those of forty or more years ago? Statistics have been called "dry bones." Mr. North, in an address a few years ago, stated that statisticians resented this popular idea about the dry bones of statistics, that there is nothing dry about them, that they are moist, juicy, fragrant as all the "perfumes of Arabia." They are more poetic than poetry, more artistic than art, more musical than music, more philosophical than philosophy. He thought then, and I think he is of the same opinion now, that the temptation to weave romances out of statistics is so strong that some so-called statisticians are wholly unable to resist it, and this is mainly true.

This romantic idea leads to what we know as the statistical mechanic, the man who is ready to construct tables to order. Yet the real statistician, the man who is working out the process of making them, does not make tables to order, but he puts an integrity and devotion into his work that is not surpassed in any other line of official conduct.

The spirit of the modern statistician lies in the precepts laid

down by General Walker and in the fact that there is something deeper and more comprehensive than the mere statement of figures, for the statistician must have the spirit of what again Mr. North has called ethical philosophy, the recognition of the existence of the great fundamental law, the principle which governs this world and all things in it,—the principle of evolution.

How perfectly true this is, and how absolutely lacking was this spirit at the time of the organization of this Association! The modern statistician makes statistics popular by presenting their results in popular and readable form. The official statistician is under limitations in this respect, for his work, no matter what his spirit is, must, to a certain degree, be conventional, for it must be official in its character; but the Association to which we are devoted can put this spirit into its work in interpreting the statistics of the government.

The field for our exploitation is vast and rich, and it is growing vaster and richer as time goes on. We now have what we have long needed, a permanent census office, a great clearing house of federal statistics, and more and more Congress will use it as the vehicle for sending out to the people its costly information. Not only this, but more and more will it consolidate into the Census Office other statistical works, so that there shall be harmony in preparation, unity and science in presentation.

The United States now holds a unique position in statistical work. As I have intimated, no other country approaches it. Any one who has given any consideration whatever to the volumes and bulletins which are coming out of that office must concede this fact, and feel proud every time that such a volume is examined that we not only now have an office competent, adequate, skilfully manned to make it a great clearing house of statistical information, but that we have a man, one of our own Vice-Presidents, at the head of it who comprehends that spirit to which I have alluded,—who has the judgment, the intellect, and the ability which makes him pre-eminently the peer of any statistician the world can name, and holding a field

and having an opportunity not even approached by any other statistician on earth. He understands clearly the duty to which he is assigned. He understands not only the present scope of his work, but what it may be made to reach in the future.

He knows that he is painting a grand and enduring picture, not in bright colors mixed and laid by an artist's hand on canvas which might not tell at the close of another century of the work of our generation, nor yet in glowing words of description by sentences constructed by most gifted writers, whose language one hundred years hence might not mean all the interpretation we give it in our time, nor in any of the perishable methods which convey to posterity as much of the vanity of a people as of the reality which makes the Commonwealth of to-day; but that he sets the picture in cold, enduring Arabic characters, which have survived through the centuries that have passed, unchanged and unchangeable by time, by accident, or by decay, and will remain through the ages to come as truthful as of old. They are the symbols that have unlocked to us the growth of the periods which make up our past. They are the fitting and never-changing symbols by which to tell the story of our present state, so that, when the age we live in becomes the past of successive generations of men, the story and the picture shall be found to exist in all the just proportions in which it has been set by ourselves. A quiet and may be unlovely setting the statistician chooses, but he knows it will endure through all time.

At the close of the address of the President, Dr. Samuel W. Dike said:—

This address has noted the many State Bureaus of Labor (34 in all, I think) besides the National Bureaus that have grown out of the Massachusetts Bureau of Labor Statistics. Mr. Wright, I believe, might have also mentioned two or three important European Statistical Bureaus that owe their origin largely to our Massachusetts Bureau. I happen to have heard from excellent authority many years ago the story of the

way in which the Massachusetts Bureau was saved from impending extinction and started on the road to success. The briefest statement of an incident will give you the clue. The Massachusetts Bureau had dragged along for three or four years, and seemed to be on its last legs. Governor Washburn sent for Colonel Carroll D. Wright, then a young man scarcely rising above thirty years of age, who was completing his term of service in the State Senate, and said to him, "I have watched your work on some measures before the legislature, and now I want you to take this Bureau of Labor and make it or bust it!" After considerable urging on the part of the governor, the young man, who was intent on returning to his excellent law practice and was without statistical experience, consented.

THE OUTLOOK FOR STATISTICAL SCIENCE IN THE UNITED STATES.*

By S. N. D. North.

I am glad of the opportunity to supplement President Wright's interesting retrospect with a brief allusion to the present situation and the future outlook for statistical science in this country, and more especially in relation to the statistical work of the government.

I have but one criticism to make upon the address. It resembles the play of "Hamlet," with Hamlet left out. It nowhere hints that Colonel Wright has contributed more to the development of statistical work in the United States, and to its substantial advancement along straight and sane lines, than any other living American. Colonel Wright could not say all this, but I can.

We cannot yet fully realize what a tremendous step forward was taken when the Census Office was made a permanent institution by the act of March 6, 1902. No single thing, save only the requirement for a decennial census in the Federal Constitution, has done so much to promote the study and to perfect the methods of statistics as that legislation, to which Congress consented with the utmost reluctance and with much misgiving.

It will only be after a decennial census has been taken that we can measure the gain that must come in the quality of the work by reason of the existence of the permanent bureau. That the gain will be tangible and real we already know; for a large part of the work of the office has been concentrated during this interval upon a study of weaknesses and defects and upon plans for strengthening the machinery and improving the methods.

*Address delivered at the annual meeting of the American Statistical Association Jan. 17, 1908.

The bill already introduced in Congress for the taking of the thirteenth census is the first visible result. The bill has received a more careful study by the best statistical experts than was ever before given to a census law.

I believe it has but one serious defect: that is the provision for the appointment of the temporary clerical force after non-competitive examinations rather than through the usual civil service method. The Director ought to be wholly relieved, during the progress of the tremendously difficult work of a decennial census, of all pressure for patronage.

We hope to see it enacted at the present session of Congress. This will be a year earlier than the usual date of census legislation heretofore. This additional year for preparation, by the complete organization of the working machinery, kept alive at its highest efficiency, means a good job, more deliberately and carefully done than was ever possible before.

There has been much speculation as to the margin of error in past censuses. It is customary to reassure the doubters by the statement that one error tends to offset and balance another, giving a net result sufficiently near the truth for all practical purposes. I have always been sceptical as to the soundness of this reasoning. At the next census we may make some discoveries that will be startling. At any rate, we are for the first time in a position where we can intelligently check one census with another.

The permanent Census Office has created a training school for government statisticians. Many of you will recall the remark of General Walker in 1896, that "the government which has spent millions and tens of millions in the collection, compilation, and publication of statistics, had never spent anything in training and preparing the men who should conduct the statistical work of the country." We have an army and a military academy to train men in military science, a navy and a naval academy to prepare men to conduct the service of the navy in war and in peace; but for the development of the science of statistics, the science whose light guides and directs the action of legislature in the shaping of policies that

are to determine the future of the nation, we have simply taken our chances, with a resultant waste which is appalling and an impairment of the validity and accuracy of official statistical data even more appalling.

The permanent Census Office is destined to be our statistical West Point. Already more than twoscore of the best census clerks have gone into other bureaus and departments of the government to engage in various statistical investigations in connection with administrative work,—to the Bureaus of Corporations, of Manufactures, of Forestry, of Labor, and various bureaus of the Department of Agriculture. These statisticians have received a severe and exacting training. Every table or statistical presentation prepared in the office undergoes a merciless criticism and analysis before it reaches the printer. It must be defended, proved, and justified, or be sent back for reconstruction. No university subjects a thesis to more drastic criticism. Most of the clerks who go out after such a training can be trusted to make the most of it in their new fields. I am proud of the record that census-trained clerks are already making in other branches of the government service.

Others have gone into important private posts, still others to State statistical bureaus, and others still to the colleges and universities.

One of the most notable recent developments in higher education is the introduction of the study of statistics as an adjunct to the courses in Political Economy. I know of half a dozen institutions where well-organized statistical courses exist, and no doubt there are more. Many of these university teachers of statistics maintain intimate relations with the Census Office. It is a source of pride to us that census reports are in regular use as text-books.

The relations of the university and the Census Office should be even more intimate than at present. What we now most need is the friendly criticism and suggestion of the trained men, who, through constant use of census reports, come to know their defects. The producers and the consumers of

statistics should be in constant sympathetic co-operation. Helpful suggestions have already come from the consumers. But there should be more of them. There should exist the feeling among the teachers of statistics and of statistical methods that the federal Census Office is not only intended for their use, but is in a large degree dependent upon them for the development of its work along right lines.

Especially should this relationship exist between the Census Office and the American Statistical Association, the one organization in this country whose members are vitally concerned in the work set for us to do. Statistics are your tools. Help us, by friendly criticism and constant suggestion, to keep your tools keen-edged and well tempered, to establish a true standard gauge for the accurate measurement and comparison of the wonderful and multifold conditions of American development.

This is the more important because the Census Office is rapidly coming to be recognized as the general information bureau of the government. The correspondence of the bureau, involving inquiry of one kind and another, is enormous. Fully one-half of it is referred to the census from some other bureau or department. This fact illustrates the confusion which exists in the public mind as to where to apply for statistical information from the government. The statistical work has heretofore been so divided up and the names of the bureaus have been so misleading that the public is utterly at a loss. Letters are sent hit or miss, and the red tape of circumlocution is appalling. For instance, we have a Bureau of Manufactures in the Department of Commerce and Labor and at the same time a Division of Manufactures in the Census Office. The latter takes a complete census of manufacturing industries every five years, and alone can answer the bulk of the inquiries which pour in upon the Bureau of Manufactures. We have a Bureau of Statistics in the Department of Commerce and Labor, which deals only with the statistics of foreign and domestic commerce, and gets thousands of letters which must be referred to the Census. To make confusion more confounded, we have another Bureau

of Statistics in the Department of Agriculture. This bureau is of course concerned only with agricultural investigations, and even in that restricted field it deals not with actual statistics, which only the Census Office compiles, but with yearly crop estimates, which, it is needless to add, are totally different from statistics.

There thus exists a veritable babel in the designations of the bureaus that handle government statistics. This confusion is the outcome of a gradual but disjointed and haphazard development, which was the natural consequence of the fact that prior to the establishment of the permanent Census Office there existed no general statistical bureau to which the accretions of statistical work could appropriately be attached. It is a situation almost grotesque, but one which will gradually right itself. I am glad to be able to inform you that the present Secretary of Commerce and Labor has the problem under consideration, and is about to take an important step for the simplification and clarification of the existing confusion. The law which established the department of Commerce and Labor recognized the fact that this department was to become the chief statistical department of the government. With that end in view it conferred upon the Secretary unusual powers for the consolidation and rearrangement of statistical work. I believe this power is about to be exercised by Secretary Straus in a wise and effective manner.

It is of the utmost importance, in my judgment, that a definite apportionment of the responsibility for the government official statistics should be made. I cannot overstate the need for it, as it is revealed in the daily routine of the Census Office. The daily correspondence confirms another remark of General Walker; *i.e.*, "The American people are intensely and passionately devoted to statistics." They make more frequent use of them, perhaps, than any other people; and, of course, they subject them to every possible misuse. It is their too frequent habit to accept any figures presented in tabular form as "statistics," and to jump at the obvious conclusion. I regard it as no minor function of the permanent Census Office to act as a

check upon this vicious habit. It is immensely important that there shall be an official "hall mark" upon statistical publications: far more important than in the purchase of articles of gold or silver, the value of which is of interest only to a few individuals. It is a part of the duty of the Census Office to furnish the "hall mark" wherever it can and to decline to furnish it wherever it must. There should be some national criterion for all statistics which are labelled "official." This is a function of the permanent Census Office which, so far as I know, has not hitherto been suggested.

By the wise, impartial, and conscientious exercise of this function the standard of statistical accuracy will be materially advanced and the indiscriminate or perverted use of statistics, or of figures purporting to be statistics, greatly restricted. The trust thus imposed upon the Census Office is a grave responsibility. It would work an incalculable injury to the cause of statistical science if anything should happen to impair public confidence in the integrity and reliability of the census; and it is one of the best traditions of this office that its reports should point out and emphasize the limitations and sources of error in the statistics which it compiles, and thus guard against their misinterpretation.

Now a word as to the practical utility of the Census Office during the intercensal years. It makes for more exact statistics to concentrate the statistical work of the government, so far as practicable and wherever separated from administrative functions, in one central bureau, under one general supervision, and with a general unity of method. There must always be exceptions, as in the case of financial statistics, which the Treasury must compile. But what we may call the general, non-administrative statistics of the government—statistics collected primarily for the sake of the knowledge they give of general sociological and economic conditions—can always be handled to the best advantage in one office, whose business it is to do nothing else, which has no executive functions, which is under constant spur to do this one thing better and better, which can measure and test the results secured in one branch of statistical

work by those obtained in others, and can co-ordinate, unify, and verify the whole.

This last is an extremely important consideration. If I should seek the one word which best describes the most useful function of the permanent office, I should call it the standardization of official statistics; and you will permit me briefly to illustrate what I mean. One of the great defects of the statistical work of the government has been not merely the duplication of statistics, but the inconsistency and discrepancy which have existed between statistics on subjects closely related, emanating from different bureaus of the government.

Not all the duplication has disappeared, but it has been greatly curtailed since the establishment of the permanent office.

The inconsistencies and discrepancies have been still more reduced; and the federal statistics harmonize with each other more nearly since the permanent office came into being than ever before. There is still much to be done in this way; and I esteem this one of the most important functions of the permanent office.

The plan pursued to this end is very simple. It rests upon the proposition that the Census Office is a sort of general statistical clearing house for the government. There is hardly a point at which its work does not come in touch, more or less close, with the statistical work done by other government offices. Wherever and whenever this contact arises, it is the policy of the Census Office to get into touch with that other office, and by co-operation, study, comparison, to bring the joint results into harmony.

The statistics of gold and silver production, as compiled by the census, the Mint, and the Geological Survey, now harmonize; and they are more accurate than ever before, because their compilation has had the benefit of the combined knowledge, facilities, and experience of all three offices.

The statistics of imports and exports have been so reclassified that they harmonize with the census statistics of manufactures, and it is now possible to determine, for every great line of manufacture, with each recurring five-year census, just what

proportion of the product is exported and what proportion consumed at home.

The annual statistics of the lumber cut, required by the Forest Service, are now compiled by the Census Office in co-operation with the Forestry Bureau, and harmonize with the five-year censuses of the lumber industry. The statistics of fisheries are compiled in co-operation with the Fish Commission. A close working arrangement exists between the census and the Inter-State Commerce Commission in the compilation of the statistics of transportation. In agricultural statistics the Census Bureau and the Bureau of Statistics of the Department of Agriculture now interchange information and work together instead of seeking to discredit each other's figures, as was formerly the case. The Geological Survey and the Census Office unite in collecting the statistics of mining. Arrangements are pending for similar co-operation with the Bureau of Education. I might illustrate by a number of additional instances.

Until there was a permanent Census Office, this co-ordination and correlation of government statistics was impossible, because there was no bureau of the government whose business it was to bring it about.

Curiously enough, it is a reason for the existence of a permanent office which was not even thought of when the bill for its establishment was under consideration in Congress.

But it is not alone in federal statistics that this good work is progressing. The Census Office is in more or less intimate touch with the statistical bureaus of all the States; and the work of standardizing their schedules of inquiry and their presentation of data has made rapid progress.

Quite as important is the census work in the standardizing of vital statistics. The United States is behind, and far behind, every other great civilized nation—including Japan—in the field of vital statistics,—the field that touches the people most closely because of its intimate relation to the public health. As to births, we have no registration whatever of which any effective use can be made. As to deaths, but few of the States

have possessed effective registration laws until recently. Formerly the laws differed widely in scope and requirement, and the returns under them were impossible of scientific classification. In the brief interval since the census has been at work in this field, it has secured the adoption of its "standard certificate" of deaths in practically the entire registration area, thus making it possible, for the first time, to accurately judge the health conditions of one community by comparison with those in others. No single step ever taken by a federal bureau meant so much for the future physical welfare and sanitary protection of the American people as the successful introduction of this "standard certificate." If we had done nothing else, we would still have justified our existence by this single achievement. Moreover, largely as the result of an earnest propaganda by the Census Office, the number of States and cities in which effective registration laws are efficiently administered has greatly increased. These States and cities contained a population of 30,765,618 in 1900, or 40.5 per cent. of the total population: now they represent a population of 36,846,981, or 48.5 per cent. of the total. We are hopeful that at least two great States of the Middle West will be added during the present winter.

A third field in which the census is blazing the way to standardization is that of public accounting. Confusion worse confounded exists in the methods of book-keeping which now prevail in State, city, town, and county governments. In whatever direction we turn, we find an absence of uniformity, a lack of system, a confusion of methods, which originated in the separate organization of independent States and independent communities within the States. The progress of our own peculiar civilization is conditional upon the gradual unification of these diverse and conflicting statutory and administrative anomalies in the book-keeping of public finances. The most prolific source of municipal graft, its securest hiding-place, its most effective agency in seeking immunity, is the chaos existing in municipal book-keeping and in the classification of municipal accounts.

To each of the 157 cities of the United States having a population of 30,000 and over, a representative of the census goes every year, and so classifies the receipts and expenditures for every purpose that each city now knows just what it costs, in comparison with the cost in other cities of its class, to maintain schools, police, fire department, streets, sewers,—every important item of municipal expense. This is a magnificent work, furnishing a most effective weapon in the crusade for municipal reform and rehabilitation now sweeping over the United States.

These are some of the directions in which the permanent Census Office has already been able to lay the foundation for the standardization of official statistics. Our plans contemplate the unification of these statistics at every point where the work of the census touches the statistical work of any bureau, board, or commission in any State, city, or county throughout the United States. To lead the way, by example, by co-operation, by advice, in reducing the huge mass of ill-arranged and discordant State and municipal statistics to an orderly and comparable basis, is a most important function of the permanent census.

These things make me confident that the outlook for statistical science, in its application to government work, is full of promise and encouragement. A definite, well-directed movement for the standardization of official statistics is under way, and has already made rapid progress. I believe this movement, in its far-reaching, practical results, to be the most important work now in progress in the government service. It needs the co-operation, encouragement, and active assistance of every one interested in statistical science. It has only just started; but it has got a good start, and it must not be permitted to go wrong. Goethe was not quite ready to admit that "figures govern the world." But, if not true in his day, it is becoming true as time passes. In the kind of problems with which modern government has to deal, a column of figures may prove more potent than a column of soldiers, and a statistical table may exercise more influence than a flotilla of battleships!

AN INTERPRETATION OF CERTAIN STATISTICAL EVIDENCE OF CONCENTRATION OF WEALTH.

By G. P. Watkins, Ph.D.

The growth of large fortunes, both in number and in size, is matter of common observation. It is so obvious a fact that we do not need statistics to prove it. In order to measure the strength of such a tendency, it is true, we need statistics, and statistics of such a kind as are very difficult to get.

That property is undergoing concentration seems to be a proper inference from the admitted fact of the growth of large fortunes. The assumption involved in this inference is that the amount of wealth possessed by the people as a whole remains about the same, or the same per capita. Under such circumstances, if there are more who have much property, then those who formerly had little must now have still less. The assumption needs only to be made explicit in order that the unsatisfactory basis of the inference as to concentration be evident.

That the increase in the absolute number of large fortunes along with a corresponding increase of population is of no significance is too obvious a fact to require more than passing mention. The significance of an increase of wealth more than in proportion to the increase of population (that is, an increase of per capita wealth) is not so readily perceived.

Per capita wealth is known to be increasing. If so, and if there be no change in the character of its distribution (that is, if there be no tendency either to concentration or to the opposite), large fortunes must be increasing proportionately along with small properties. As per capita wealth increases, even though there be no tendency to concentration, the number of men worth $100,000 or $1,000,000 or any other given absolute

amount should be expected also to increase. People ordinarily think of a "large fortune" as some more or less definite absolute amount. If the words be given this meaning, then increase of large fortunes evidently does *not* involve concentration of wealth. We should expect the number of large fortunes to increase not merely as population increases, but also on account of the increase of per capita wealth. Since per capita wealth has been increasing in the United States, we should expect the ratio of millionaires to population to increase. The fact that this ratio has increased does not prove concentration of wealth. For the same reason, neither does the fact that our greatest fortunes to-day are larger than were those of a generation ago.

We may look at the question in a different way. We may say that a man is rich when he has 100 times the average or per capita amount of property of his countrymen, and that he is very rich when he has 1,000 times the average property. According to this definition, if per capita wealth be $500, any man who has as much as $50,000 is rich. But, if per capita wealth be $1,000, a man must have $100,000 to be rich. This, I think, is the better way to define the "large fortune." The idea should be that of a *relative* quantity. Men's ideas of "middle" and "upper" economic classes are certainly relative. If we assume that the growth of large fortunes and the concentration of wealth go together, we must take the term in its relative signification. Ordinary usage is of course ambiguous, not being clearly thought out. Taking the phrase thus relatively, we find it is *not obvious* that "large fortunes" have increased in importance in the United States in the last one or two generations. It may be so. But it is not the kind of conclusion that can well be based upon mere observation. The proof of concentration of wealth is a difficult and technical statistical problem.

An obvious and apparently the usual method of interpreting statistics of fortunes or incomes classified by size is to compare the per cents. of number in the several classes at the different

dates and also the per cents. of property possessed by the several classes. An objection to such procedure is that the uppermost class has no upper boundary, though this criticism is met in part where per cents. of amount of property as well as of numbers of owners are used. To be complete, the scheme should also include a class without property; classes should be of comparatively small range. But there still remains the fundamental objection that such classes, as they have been used, are bounded by absolute and fixed amounts, while concentration is a fact of relation. The boundaries of the classes should themselves be relative numbers, and should change with the per capita of the total amount of fortunes. If wealth classes are to be employed, the dividing lines should be at multiples of some sort of an average.*

The essence of the following attempt to interpret statistics relating to concentration of wealth is its use of thoroughly relative criteria. Another important difference from usual methods of treatment consists in keeping this question as to concentration of wealth separate from the other and larger question as to the character and tendency of the distribution of incomes, including thus incomes from labor. Special attention is given also to the *peak* of the pyramid of fortunes. One reason for this—in addition to the peculiar interest of that aspect of the question which relates to the growth of great fortunes—is the difficulties met in trying to obtain tolerable statistics of small properties, as distinguished from small incomes.

To test for a tendency to concentration of wealth, probate and inheritance statistics are the best available material. There is an assumption involved in the use of such material. But it is a fair assumption that any considerable influence affecting the degree of concentration of wealth among the living will soon affect in the same direction the distribution of property in the estates of deceased persons. In other words, the errors are constant and do not affect tests of *tendency*.

* For an extended discussion of this rather technical subject of the method of measuring concentration of wealth, the reader is referred to articles by Messrs. Lorenz, Holmes, and Watkins, Publications American Statistical Association, Nos. 70, 71, 72.

The best evidence we have for the United States bearing on the question under consideration is certain probate statistics compiled by the Massachusetts Bureau of Statistics of Labor. Following are the important primary tables:—

PROBATES IN MASSACHUSETTS: NUMBER AND AMOUNTS, AND THEIR PERCENTAGE DISTRIBUTION, 1829–31.*

	Number.	Per Cent.	Amount.	Per Cent.
Under $500	1,431	38.7	265,544	1.8
500– 1,000	463	12.5	339,008	2.3
1,000– 5,000	1,274	34.5	3,022,264	20.9
5,000– 10,000	295	8.0	2,005,832	13.8
10,000– 25,000	157	4.2	2,426,465	16.8
25,000– 50,000	42	1.1	1,477,132	10.2
50,000–100,000	25	.7	1,829,147	12.6
100,000–200,000	6		805,464	
300,000–400,000	2		640,063	
400,000–500,000	1 } 11	.3	415,371 } 3,128,715	21.6
500,000 and over	2		1,267,817	
Totals	3,698	100.0	14,494,107	100.0

Population in 1830, 610,408.

PROBATES IN MASSACHUSETTS: NUMBER AND AMOUNTS, AND THEIR PERCENTAGE DISTRIBUTION, 1859–61.†

	Number.	Per Cent.	Amount.	Per Cent.
Under $500	1,485	21.5	346,650	.7
500– 1,000	960	13.9	697,132	1.3
1,000– 5,000	2,827	40.9	6,791,881	12.8
5,000– 10,000	797	11.5	5,506,369	10.3
10,000– 25,000	507	7.3	7,787,931	14.6
25,000– 50,000	168	2.4	5,859,918	11.0
50,000–100,000	92	1.3	6,389,261	12.0
100,000–200,000	52		6,703,226	
200,000–300,000	18		4,275,242	
300,000–400,000	7 } 86	1.2	2,386,964 } 19,877,652	37.3
400,000–500,000	3		1,423,568	
500,000 and over	6		5,088,652	
Totals	6,922	100.0	53,256,794	100.0

Population in 1860, 1,231,066.

* The absolute numbers are from the Twenty-fifth Annual Report of the Bureau of Statistics of Labor, Massachusetts, 1894, p. 265.

† *Ibid.*, p. 267.

PROBATES IN MASSACHUSETTS: NUMBER AND AMOUNTS, AND THEIR PERCENTAGE DISTRIBUTION, 1879–81.*

	Number.	Per Cent.	Amount.	Per Cent.
Under $500	1,822	16.3	446,576	.3
500– 1,000	1,451	13.0	1,047,946	.8
1,000– 5,000	4,588	41.2	11,275,295	8.2
5,000– 10,000	1,421	12.7	9,930,540	7.2
10,000– 25,000	1,023	9.2	15,797,932	11.5
25,000– 50,000	410	3.7	13,934,412	10.1
50,000–100,000	218	2.0	15,368,430	11.2
100,000–200,000	111		15,499,848	
200,000–300,000	37		8,872,930	
300,000–400,000	22 (209)	1.9	7,618,947 (69,573,128)	50.7
400,000–500,000	10		4,383,422	
500,000 and over	29		33,197,981	
Totals	11,142	100.0	137,374,259	100.0

Population in 1880, 1,783,085.

PROBATES IN MASSACHUSETTS: NUMBER AND AMOUNTS, AND THEIR PERCENTAGE DISTRIBUTION, 1889–91.†

	Number.	Per Cent.	Amount.	Per Cent.
Under $500	2,217	15.2	546,605	.3
500– 1,000	1,738	12.0	1,269,863	.8
1,000– 5,000	6,197	42.4	15,073,011	9.7
5,000– 10,000	1,969	13.5	13,732,143	8.8
10,000– 25,000	1,498	10.2	23,142,749	14.9
25,000– 50,000	480	3.3	16,615,001	10.7
50,000–100,000	265	1.8	18,488,782	11.9
100,000–200,000	134		18,309,688	
200,000–300,000	45		11,191,055	
300,000–400,000	22 (244)	1.6	7,462,719 (66,690,634)	42.9
400,000–500,000	13		5,885,293	
500,000 and over	30		23,841,879	
Totals	14,608	100.0	155,558,788	100.0

Population in 1890, 2,238,947.

* The absolute numbers are from the Twenty-fifth Annual Report of the Bureau of Statistics of Labor, Massachusetts, 1894, p. 267.

† *Ibid.*, p. 267.

In these statistics there is exhibited a notable tendency to an increased number of the larger fortunes. There were two estates of over half a million probated in the earliest three-year period, and 30 such probated sixty years later. Meanwhile population had increased 267 per cent. The estates above $100,000 were 11 in number in the earliest period, and 244 in the latest. The wealth of the community certainly did not increase at such a rate. The greatest growth of riches, but chiefly in numbers of moderate fortunes, appears to have occurred in the thirty years preceding the Civil War. In the latest decade covered there appears a tendency to reverse the process. For the latest period there is a decline in the *relative* number of half-million dollar estates probated. The tendency to concentration doubtless began to produce marked effects earlier in Massachusetts than elsewhere, owing to its leadership in manufactures and its lack of capacity for agricultural expansion. Hence the tendency may well have worked itself out by 1880.

But let us consider these figures in their proper relation to the growth of per capita wealth. According to the United States Census, the "true valuation" of real and personal property in Massachusetts for several decades past was as follows:—

PER CAPITA WEALTH IN MASSACHUSETTS.

Year.	*Amount*
1850	$577
1860	662
1870	1,463
1880	1,471
1890	1,252
1900	1,554

The per capita wealth of the State thus declined noticeably between 1880 and 1890. The two sets of figures, probate and census, are in general agreement as regards the indication that the relatively large number of estates of half a million or more in 1880 was in part but an expression of the greater per capita wealth of the State in that and in the immediately preceding years, as compared with ten years later and with twenty years

earlier. If a thorough relative test were applied, the year 1880 would probably not stand out so prominently in this matter of concentration of wealth as it does when one uses fixed class boundaries or any method which involves definition of the large fortune absolutely.

If the character of the actual statistics permitted the plotting of a practicable curve indicating relative quantities (that is, percentages), comparison of the course of such curves for different sets of data would immediately indicate to the eye which set was characterized by greater concentration.* The pyramid of fortunes, however, is of such a nature as not to lend itself readily to such diagramming. It is significant of prevailing inequality that the attempt to construct the curves fails because of the disproportion between the flattened base of the pyramid and the elongated peak. The curves resemble a capital L with enormously elongated arms and so little thickness of the different parts that the eye can form no judgment of quantitative relations. This is explained by the fact that the curve of the distribution of property is hyperbolic in its general characteristics.† Quantities arranged in something like a hyperbolic series do not lend themselves readily to ordinary graphic representation.

But a hyperbola is very easily represented graphically if one will plot the logarithms of the numbers instead of the numbers themselves. Just what the degree of difference is between two series of numbers so compared is not obvious, at any rate

* This is Mr. Lorenz's proposed method in the article referred to above. It is significant that Mr. Lorenz uses hypothetical figures, and thus fails to perceive the limited practical value of the particular species of graphic method that he prefers. The value of my comment in this discussion is subject to a similar qualification.

† If the statistics dealt with were not concentrated upon round numbers, the hyperbolic nature of the distribution of estates would find expression in the position of the arithmetic average of the estates within each class; that is, it should in each case be near the geometrical mean between the limits of the class. The Massachusetts statistics conform to this rule almost without exception. The British statistics almost as regularly do not conform to it; that is, the arithmetic average of the estates within the class is usually considerably above the arithmetic mean between the approximate boundaries of the class. The difference is explained by the fact that the estates at the round number which marks the lower limit of the class are included in it in the Massachusetts figures and the upper limit is exclusive; while in the British figures the lower limit is exclusive, and the upper limit inclusive, and especially the lower limit marks the transition to a higher tax rate.

to one who is not a trained mathematician; but the *direction* of the difference is unmistakable, and the method of testing for concentration is, so far as the writer can see, not open to criticism. This is what is needed.*

In the comparison of the logarithmic curves used in the following diagrams the crucial point is their *slant.* The steeper of two curves is the one which expresses the greater concentration. The scale used to represent the size of fortunes plotted must of course be identical for different sets of figures. The distance used to represent the logarithm of a given number of fortunes must also be the same for the different series compared. In order to assist the eye in comparing slants, however, it is often well to shift this latter scale along its own length, for one or more terms of the comparison, so as to bring the curves together at some convenient point. This is done in the following diagrams. Hence the logarithmic scale across the bottom of the diagrams indicates the actual logarithms plotted only in the case of the full line curves. In the other curves the scale corresponds to the series of logarithms plus a constant amount. The curves of the same diagram are thus made to start from the bottom at approximately the same

* As compared with the rearrangement of the statistics by the method of relative class boundaries, which also meets the requirement of defining large and small and middling fortunes relatively (that is, as so many times the mean fortune), the method of plotting logarithms has decided advantages. Of most practical importance is the fact that the amount of calculation involved in the use of the former method is prohibitive. The convincingness of the results, furthermore, is lessened by the necessity of using certain mathematical assumptions in rearranging the statistics. These assumptions are based upon principles not different from those used above, but are less satisfactory in application because more depends upon the accuracy of the fundamental averages. These averages are likely to be especially affected by inaccuracy in the reporting of small estates. Of the available averages the median is intrinsically to be preferred, since to measure the tendency towards large fortunes by a method which rests upon the arithmetic average is to weigh them in a balance the lengths of the arms of which are very largely determined by the large fortunes themselves. But the median would probably be most affected by the error resulting from the inclusion of a large number of debtor estates in the statistics.

More summary methods of testing for concentration may be in principle equally correct with those used in this article, but they do not deal directly or mainly with the point of most general interest; that is, the growth of great fortunes. For a summary test nothing could be better, it seems to me, provided satisfactory data are available, than the comparison of the median and the average, of course, by the use of the *ratio* of their difference to their sum or to one or the other quantity as a base, in order to preserve that relativity which is the essence of any correct measure of concentration.

point, each point of a shifted curve being moved horizontally the same distance.

It is hardly necessary to add that, in judging these logarithmic curves by their comparative slant, the requirement of relativity in the test of concentration is fully and easily met.

The logarithms obtained for the above Massachusetts statistics, with the corresponding numbers, are as follows:—

Size of Estates, as large as	Log.	1830.		1860.		1880.		1890.	
		Number Estates.	Log.	Number Estates.	Log.	Number Estates.	Log.	Number Estates.	Log.
$1,000 . . .	3.000	1,804	3.256	4,477	3.651	7,869	3.896	10,653	4.027
5,000 . . .	3.699	530	2.724	1,650	3.217	3,281	3.516	4,456	3.649
10,000 . . .	4.000	235	2.371	853	2.931	1,860	3.270	2,487	3.396
25,000 . . .	4.398	78	1.892	346	2.539	837	2.923	989	2.995
50,000 . . .	4.699	36	1.556	178	2.250	427	2.630	509	2.707
100,000 . . .	5.000	11	1.041	86	1.934	209	2.320	244	2.387
200,000 . . .	5.301	5	0.699	34	1.531	98	1.991	110	2.041
300,000 . . .	5.477	5	0.699	16	1.204	61	1.785	65	1.813
400,000 . . .	5.602	3	0.477	9	0.954	39	1.591	43	1.633
500,000 . . .	5.699	2	0.301	6	0.778	29	1.462	30	1.477

Plotting these data, we obtain the curves of Figure 1.*

* Where the lower part of another curve is not distinguishable from the curve for the statistics of latest date, it is discontinued. The numbers at the bottom of the diagram indicating the scale are those of the logarithms for the latest date. The measurement units are, of course, the same for the other sets of logarithms, but the scale is moved to the right a sufficient number of units to make the lower ends of all the curves coincide.

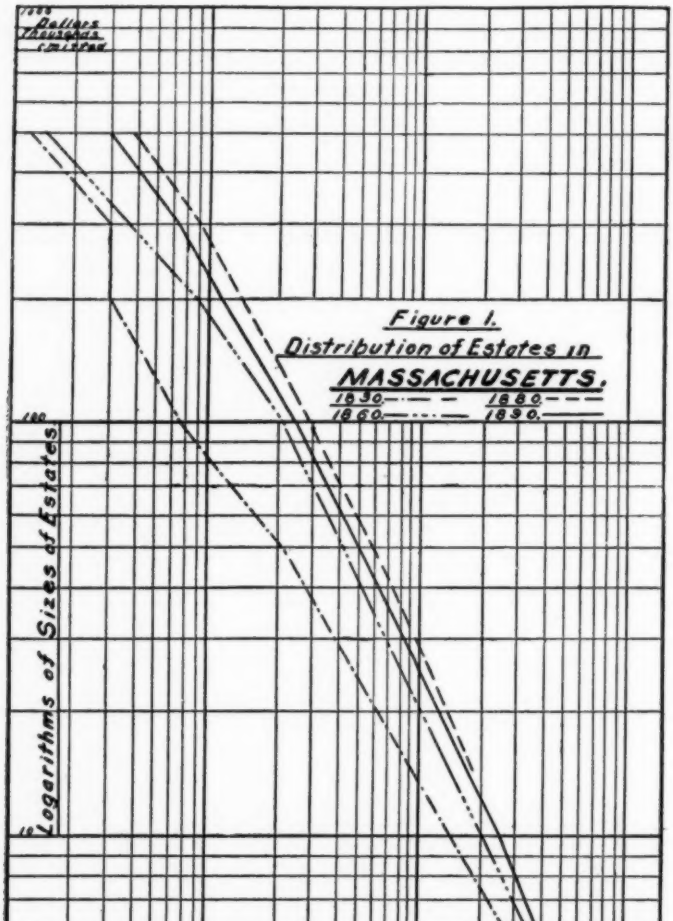


Figure 1.
Distribution of Estates in
MASSACHUSETTS.
1830. — — 1880. - - -
1860. —·—·— 1890. ——
Logarithms of Sizes of Estates.
Logarithms of Number of Estates.

It is clear that there has been, in the period covered by these statistics, on the whole a pronounced tendency to concentration of wealth in Massachusetts. There was, however, a greater degree of concentration in 1880 than in 1890. The fact that the per capita wealth of Massachusetts in 1890 was less than in 1880 does not affect a test by the comparative slants of logarithmic curves. Neither does the omission of all reference to the propertyless affect in principle such a comparison. In the case of greater per capita wealth it is true one should be careful to allow determining points higher up on the curve to have their due influence on the judgment of slant.*

It is noticeable how closely these logarithmic curves approximate a straight line. A curve plotted thus by logarithms as a straight line is what is known to physicists and mathematicians as an adiabatic curve. The curve exhibits the relation between the pressure and the volume of a gas upon the assumption that it expands and contracts without either receiving or giving out heat. It is a general hyperbola.†

Probate reports do not furnish unimpeachable statistical material. But, as regards accuracy, it is only a constant ten-

* The writer has worked somewhat upon certain probate statistics of Maryland. Figures for Baltimore City, 1875 to 1880 inclusive, and 1888 to 1893 inclusive, and for the counties of Maryland, except Baltimore City, 1875 to 1879 inclusive, and 1890 to 1894 inclusive, are to be found in the Reports of the Bureau of Industrial Statistics of Maryland. They show a tendency to concentration for the State as a whole, though the statistics of Baltimore City by itself point slightly the other way.

† For the suggestion of the possibilities presented by the use of logarithmic curves for the purposes of this article, I am indebted to my colleague, Dr. F. R. Sharpe, of the Department of Mathematics, Cornell University. The same method is used by Pareto in his "Cours d'Économie Politique," vol. ii, p. 305, but for income curves. Pareto mentions the fact that the curve approximates a straight line. Mr. Lorenz's remarks about the logarithmic curve (pp. 216, 217) appear to be rather hasty. The "fixed classification" in the case of figures that are properly to be called statistics will have no effect on the steepness of the curve. It is true that the curve used above indicates nothing as to what may happen in the uppermost class; but can Mr. Lorenz's one multi-millionaire, however manipulated, form any basis for a statistical inference? The few cases at the very top must be treated separately if that appears necessary. Mr. Lorenz's suggested modification of the logarithmic method, which gives a place to the amount possessed by each class, has some advantages. Are they sufficient to outweigh added difficulties of visual interpretation? In any large body of reliable statistics, given the type of distribution as indicated, *e.g.*, by the numbers in the classes, the amount of wealth owned by each class will bear a known relation to its numbers, except possibly in the case of the highest and lowest classes. The amounts would be determinable by accepted principles of interpolation.

dency to errors of the same sort that seriously affects inferences drawn where the significant numbers are relative. The constant errors, moreover, are such as to reduce the appearance of concentration. There is a tendency to overstate the value of small estates on account of not allowing for debts. For large estates there is a presumption of understatement, perhaps from habits acquired relative to statements made with reference to assessment for taxation. If this last is true, the weight of the large and largest fortunes is greater than appears. In the test, by the comparative slant of logarithmic curves the effect of the most important sources of constant error may be evaded by disregarding the portion of the curve that represents the number of small estates. Probated estates are also to a degree misrepresentative of contemporary fortunes, since they were made in the past and are in larger proportion estates of inactive investors. But this error is also constant or else to some degree unfavorable to the inferences drawn.* Of other objections to basing conclusions on probate statistics, it may likewise be said, in general, either that they are constant and do not affect the inference as to tendency or that they are different in their incidence on estates in such a way as to give the large estates less apparent than real gain.†

A pertinent objection to inferences as to the growth of riches is that the fewness of the largest fortunes implies a large "probable error" in the conclusion. But this objection is of more force against attempts to measure degree of concentration than against the determination merely of the fact that there is a tendency in that direction. And the establishment of this fact does not depend on this one point in the evidence.

It is perhaps worth while to test the comparative width of distribution; that is, the proportion of propertied to propertyless classes. This can be done for comparative purposes by

* Has the adult death-rate among classes having property declined much in Massachusetts from 1830 to 1890? Only so far as such a decline has affected different economic classes differently would it affect inferences relating to concentration.

† *Cf.* Mayo-Smith, "Statistics and Economics," p. 434, and Ely's comment, "Evolution of Industrial Society," pp. 266, 267.

getting ratios of probates to population. These are, probates per 10,000 of population, in Massachusetts:—

1830 (approximately)	. . . . .	20.2
1860 "	. . . . .	18.8
1880 "	. . . . .	20.8
1890 "	. . . . .	21.7

No attempt is made to calculate the percentage of property owners to total population. The ratio of probates to population we should expect to increase, owing to the growth of savings institutions. A declining birth-rate or any other cause (*e.g.*, immigration) that tends to increase the proportion of adults in the total population would produce the same appearance. This phase of the question, touching the proportion of property owners in the population, is also most affected by inaccuracy in probate statistics, hence the symptoms exhibited among the property owners are more significant. Perhaps the most that can be inferred from the ratios just given is that there has been no important change in the relative number of probates such that it would give ground for a suspicion that the figures for different decades are not comparable.

The tendency to concentration, or to an increase in large fortunes, is a result of general causes operating throughout the western world. Evidence from other countries is important as supporting the conclusion from the statistics directly relating to the United States.

Probate statistics for Great Britain and Ireland follow:—

AMOUNT OF PERSONAL PROPERTY IN ESTATES SUBJECT TO PROBATE AND ADMINISTRATION DUTIES IN THE UNITED KINGDOM, 1838.*

Size of (Personal) Estate.	Number.	Amount.
Under £1,000 †	18,316	£5,546,555
£1,000 to 10,000	6,006	18,275,560
10,000 to 25,000	685	10,427,750
25,000 to 50,000	216	7,050,000
50,000 to 75,000	53	3,095,000
75,000 to 100,000	30	2,580,000
100,000 to 500,000	35	5,712,500
500,000 to 1,000,000	2	1,200,000
1,000,000 and upwards	1	1,000,000
Totals	25,344	£54,887,305

Population of United Kingdom in 1838 (estimated), 25,905,194.

NUMBER AND NET CAPITAL VALUE OF ESTATES ASSESSED TO PROBATE DUTY IN THE UNITED KINGDOM, CLASSIFIED BY SIZE, DURING THE 5-YEAR PERIOD 1884–85 TO 1888–89 (EXCLUSIVE OF PROPERTY ASSESSED TO CORPORATION DUTY).‡

Class.	Number.	Amount.
Of £1,000 and under £4,000 §	41,326	£86,069
" 4,000 " " 10,000	14,441	92,473
" 10,000 " " 50,000	10,145	214,303
" 50,000 " " 100,000	1,251	87,581
" 100,000 " " 500,000	737	138,959
" 500,000 " " 1,000,000	43	28,085
" 1,000,000 and upwards	12	20,811
Totals	67,955	668,281

Population in 1887 (estimated), 36,593,692.

* Data from Porter, "Progress of the Nation," 1843, vol. iii, pp. 131–133. There are errors in certain of his totals which are corrected in the above.

† The lowest class taxed is £20 to £100.

‡ United Kingdom Statistical Abstract, 41st number, p. 35.

§ Estates below £1,000 include estates below £300 at gross value, hence this class is omitted.

NUMBER AND NET CAPITAL VALUE OF ESTATES OR PORTIONS OF ESTATES LIABLE TO ESTATE DUTY IN THE UNITED KINGDOM, CLASSIFIED BY SIZE, FOR THE 5-YEAR PERIOD 1901–02 TO 1905–06.*

Class.	Number.	Amount.
Exceeding £100 but not exceeding £500	28,551	£13,069
" 500 " 1,000	49,136	41,131
" 1,000 " 10,000	81,140	298,441
" 10,000 " 25,000	11,221	203,973
" 25,000 " 50,000	4,500	175,188
" 50,000 " 75,000	1,403	95,852
" 75,000 " 100,000	699	65,026
" 100,000 " 150,000	649	85,812
" 150,000 " 250,000	427	92,089
" 250,000 " 500,000	246	93,075
" 500,000 " 1,000,000	99	77,437
" 1,000,000	28	84,608
Totals	178,099	£1,325,701

Population in 1904 was 42,793,272.†

The numbers for which logarithms are wanted, with their logarithms, follow:—

Size of Estates, as large as	Log.	1838.	
		Number Estates.	Log.
£1,000	3.000	7,028	3.847
10,000	4.000	1,022	3.009
25,000	4.398	337	2.528
50,000	4.699	121	2.083
75,000	4.875	68	1.833
100,000	5.000	38	1.580
500,000	5.699	3	0.477
1,000,000	6.000	1	0.000

* United Kingdom Statistical Abstract, 53d number, p. 45.

† *Ibid.*, p. 347.

Size of Estates, as large as	Log.	1884–85 to 1888–89.	
		Number Estates.	Log.
£1,000	3.000	67,355	4.832
4,000	3.602	26,629	4.425
10,000	4.000	12,188	4.086
50,000	4.699	2,043	3.310
100,000	5.000	792	2.899
500,000	5.699	55	1.740
1,000,000	6.000	12	1.079

Size of Estates, as large as	Log.	1901–02 to 1905–06.	
		Number Estates.	Log.
£100	2.000	178,099	5.251
500	2.699	149,548	5.175
1,000	3.000	100,412	5.002
10,000	4.000	19,272	4.285
25,000	4.398	8,051	3.906
50,000	4.699	3,551	3.550
75,000	4.875	2,148	3.332
100,000	5.000	1,449	3.161
150,000	5.176	800	2.903
250,000	5.398	373	2.572
500,000	5.699	127	2.104
1,000,000	6.000	28	1.447

Plotting these logarithmic quantities as curves, we obtain the results exhibited in Figure 2.*

* See foot-note to Figure 1.

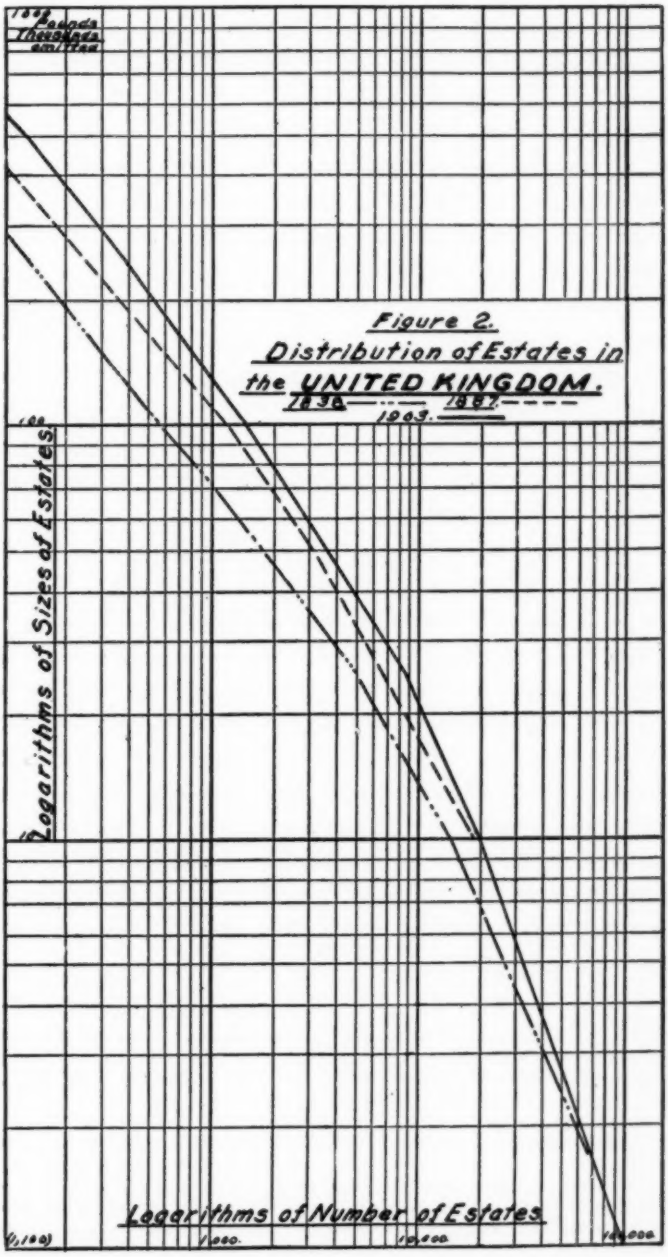


Figure 2.
Distribution of Estates in the UNITED KINGDOM.
1836.
1887.
1903.
Logarithms of Sizes of Estates.
Logarithms of Number of Estates.

These figures are not exactly comparable for the successive periods covered. Those for 1838 relate only to personalty. The same is true of the figures for 1884–85 to 1888–89,* which are therefore comparable with those of 1838. Changes in the law in 1889, followed by simplification and systematization in 1894, extended the taxation so that realty is included in the figures of later date.† As indicated in the tables above, there is a difference between the figures for the earlier periods and for the latest period used as regards the method of classification; that is, estates at the lower boundary of the class are included and those at the upper limit not in the former case, while the lower boundary of the class is exclusive and the upper inclusive in the latest figures. This does not affect the validity of the results of testing for concentration by the slant of logarithmic curves. In practice, it is true, the tendency to concentrate estimates on round numbers might make a slight difference in the reliability of the indication from a comparison of figures employing classifications differing in this respect.

The figures for the latest period include all realty, and are in every way the most reliable and complete. The ownership of realty in England is, for historical reasons, notoriously concentrated, and the appearance of greatest concentration at the latest date might be due only to the previous inadequacy of the picture. But such an argument leaves little room for much *de*centralization in the ownership of real estate. And comparison of the figures for the two earlier periods shows—even after making allowance for evident irregularity and inaccuracy of the figures for 1838—an unmistakable tendency to concentration in the ownership of personalty, which has probably not been

* Exactly what effect the qualification "exclusive of property assessed to corporation duty" would have, I am unable to say; but Giffen uses figures resulting from the identical tax laws as comparable with Porter's figures. See *Journal of the Statistical Society*, 1883, p. 614. The amount so exempted is inconsiderable.

† Bastable, "Finance," 556, ff. Spahr ("Distribution of Wealth," p. 16, ff.) is therefore mistaken in his assumption that the figures of 1892 are exclusively for personalty. Of the three sets of figures used, those for the latest period and for the intermediate period are net. Of the figures for 1838 Porter says (iii, p. 128), "The amounts are in many cases reduced by the payment of debts due from the deceased and by other charges upon their estates." Does this mean that the figures are not net?

completely reversed in the latest period. In the United States the evidence is clear for a much greater degree of concentration in the ownership of personalty than of realty, and there is likely to be no absolute inconsistency as regards economic conditions in New York and in Great Britain. The tendency of personalty, too, is the tendency of three-fourths of the wealth of Great Britain.* The conclusion that there has been, on the whole, in the last half-century, a tendency to concentration in the ownership of wealth in the United Kingdom appears to be not presumptuous.†

An important question to be considered, however, before drawing any conclusion from the above figures is, What is the relation between the character of the distribution exhibited by a combination of two sets of figures and the character of the distribution of the original series thus added together? The addition in the present case is effected through the possessors of the two kinds of property being the same persons; that is, the people of the United Kingdom. If the distribution were in each case a mere chance distribution, and if there were thus no correlation between the causes of inequality in the two cases, the effect of summation would obviously be a levelling down of previously existing inequalities. Both of these suppositions, however, are contrary to fact in the case of the statistics before us. The inequalities are not the result of chance distribution, and the same set of forces which produces inequality in the ownership of the one kind of property produces the inequality in the other case. There is thus a positive correlation of the inequalities. Certainly, no negative correlation is to be expected, such as would make the inequalities cancel each other, implying that those who possess little personalty possess much realty and *vice versa*.

Suppose, then, that there is correlation between the in-

* These facts are dealt with by the writer in a study of the economic causes of the growth of great fortunes recently published by the American Economic Association. See "The Growth of Large Fortunes," p. 49.

† Porter, in 1851 (*Journal of the Statistical Society*, p. 198), compiled figures which appear to show conclusively that there was no tendency to concentration in the ownership of personalty between 1833 and 1848.

equalities and that it is positive in its nature. Suppose, also, that the inequalities are about the same in each case, that is, that the shares in each case are corresponding proportions of the total amount distributed. Then, according to the mathematics applicable to this situation, if the positive correlation is perfect and if the inequalities are the same, the inequality resulting from summation will also be the same as the original inequalities. But, if the correlation be not quite perfect, the result of summation must be lessened inequality. If the inequality be greater in one case than in the other, and if the correlation be perfect, then the resulting inequality will be intermediate. But, *if the correlation of the original inequalities is imperfect, the resulting inequality is likely to be less than either of these* original inequalities, even though they differ considerably. This last is the case of the statistics of the United Kingdom with which we are dealing.

Though it is open to question, it may be that there is a greater inequality in the distribution of landed property in the figures for the United Kingdom than of personalty. Even so, summation of the two kinds of property would probably not produce an appearance of greater inequality than that exhibited in the distribution of the personalty by itself. The greater weight of personalty in the total of the wealth involved supports the inference that a possible greater concentration in the ownership of realty is probably not responsible for the difference between the latest figures and the others. It is highly probable, therefore, that the greater concentration at the later date is due to an actual tendency in that direction rather than to a difference in the inclusiveness of the statistics. If the appearance were the other way, the validity of an inference would be much more open to question.*

Recently counteracting factors may have been working to produce less concentration. The most recent American figures

* The period since the adoption of the present tax laws is so short that no good test of tendency on this basis is possible. The figures for the four years immediately preceding those for the latest period used, these two sets being exactly comparable, give a slant to a logarithmic curve practically indistinguishable from the latest plotted. But there were in proportion a few less estates over £1,000,000 in the later than in the earlier period.

used are, as we have seen, somewhat ambiguous. Exemptions under Schedule A of the British income tax, moreover, point to a decided gain in the ownership of income-producing property by persons with small incomes.*

On the face of the figures it appears that there is greater concentration in Great Britain than in Massachusetts, since the slant of the curves drawn to the same scales is slightly greater in the former case than in the latter. Any positive conclusion from such a comparison, however, is defeated by the different nature of the statistics used, the British figures being tax statistics and net, the Massachusetts figures being mere probate statistics, influenced by no motive to check underestimation of large estates or overestimation of small debtor estates. Since the direction of the errors is of a kind to invalidate the natural inference, no positive inference can be drawn.

For France neither estates nor incomes appear to have been classified in official publications, with reference to size, long enough to make them available to test the operation of a tendency to concentration. Succession statistics are of long standing, but have only recently been classified by size. The figures for 1903 and 1904 subjoined indicate considerably less present concentration of riches in France than in the United Kingdom or than in the older and industrialized portions of the United States.† This is the general opinion as regards the sources and the distribution of French accumulations.

* This point is developed by the writer in the study above mentioned at p. 137.

† The difference is great enough to warrant an inference, even though the statistics are not exactly comparable, especially as the differences are such as tend to conceal the difference, the British figures including *inter vivos* gifts and the American figures being not net.

CLASSIFICATION OF SUCCESSIONS ACCORDING TO NET VALUE, 1903 AND 1904.*

	Number.	Per Cent.	Amount (000's omitted).	Per Cent.
From 1 to 500 francs . . .	241,097	31.5	63,380	.6
" 501 " 2,000 . . .	208,382	27.1	265,589	2.6
" 2,001 " 10,000 . . .	205,957	26.8	1,005,423	9.8
" 10,001 " 50,000 . . .	83,889	10.9	1,791,340	17.6
" 50,001 " 100,000 . . .	13,955	1.8	975,604	9.6
" 100,001 " 250,000 . . .	8,872	1.2	1,386,095	13.6
" 250,001 " 500,000 . . .	3,073	.4	1,078,960	10.6
" 500,001 " 1,000,000 . . .	1,430	.2	990,691	9.7
" 1,000,000 " 2,000,000 . . .	664		944,248	
" 2,000,000 " 5 mil. . . .	242		712,739	
" 5 " 10 . . .	50	.1	363,277	25.9
" 10 " 50 . . .	18		319,315	
Upwards of 50 . . .	4		301,092	
	978		2,640,671	
Totals.	767,633	100	10,197,753	100

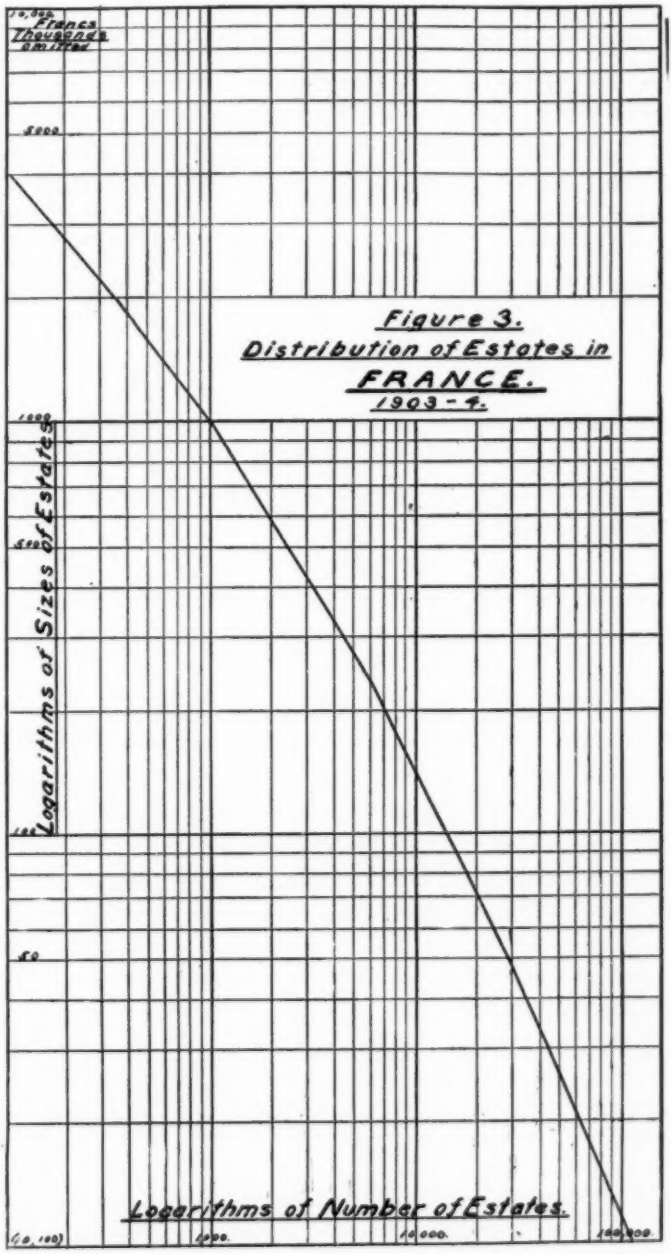
Population about 39,000,000.

The data for a logarithmic curve follow:—

Size of Estates, as large as	Log.	Number Estates.	Log.
501	2.700	526,536	5.721
2,001	3.301	318,154	5.503
10,001	4.000	112,197	5.050
50,001	4.699	28,308	4.452
100,001	5.000	14,353	4.157
250,001	5.398	5,481	3.739
500,001	5.699	2,408	3.382
1,000,000	6.000	978	2.990
2,000,000	6.301	314	2.497
5,000,000	6.699	72	1.857
10,000,000	7.000	22	1.342
50,000,000	7.699	4	0.602

These values are plotted in Figure 3.

* *Annuaire Statistique*, 1903, p. 285, and 1904, p. 231. In these two years the value of donations and successions together was 12,190.2 mil. francs, so the above statistics relate to five-sixths of the wealth of the country. See *Annuaire* for 1905, p. 78. The British figures include *inter vivos* gifts, I suppose as "portions of estates." They amount to much less than in France, as we should expect, on account of dotation and similar customs prevalent in the latter country.


Francs
Thousands
Omitted
5000
1000
500
100
50
Logarithms of Sizes of Estates.
Figure 3.
Distribution of Estates in
FRANCE.
1903-4.
Logarithms of Number of Estates.
1000.
10,000.
100,000

Yet, if we may accept the conclusions of the French authority D'Avenel, there has been a pronounced tendency to concentration in France in the last century. His summary statement is, "The richest men of to-day are 6 times as rich or, comparing those of equal fortune, 12 times as numerous, as the richest personages of the old régime; they are 10 times as rich or 20 times as numerous as the richest princes of feudal times."* After making much allowance for the unrelativity of this proportion, the statement may be accepted as indicating tendency towards concentration.

The same authority estimates the number of persons in France with an income of 200,000 francs at 1,000.† There appear to be as many as 4,000 millionaires in the United States.‡ It appears, therefore, that we have, roughly, twice as many millionaires in proportion to population as France, though our per capita wealth is about the same.

For Germany it is necessary to test concentration and its tendency by other material than statistics of inheritances. The best available material is income statistics.

Income statistics show something besides concentration of wealth. But they may show that among other things. For the largest incomes may be considered to be due almost wholly to income from property. These large incomes from property are only the cap of a change which probably affects the pyramid of incomes from top to bottom in the direction of concentration. The growth of the salaried class, known from other evidence,§

* *Revue des Deux Mondes*, February, 1906, p. 861.

† *Ibid.*, p. 866.

‡ The New York *Tribune's* List of American Millionaires (1892) gives a few more than this. Though not of a nature to be quantitatively reliable, the estimate has been considerably used for want of something better. The Massachusetts probate figures indicate a corresponding number of millionaires, so the number 4,000 may be considered a fair though rough approximation, and rather an understatement for the present date.

§ A study of occupation statistics and other data throwing light on the growth of the salaried class is only indirectly important for the purposes of this article. Concentration of wealth and concentration of incomes are different matters. But, if the class of middling incomes is being reinforced by the growth of the salaried class, and if, nevertheless, that class is no more than, or barely more than, holding its own, as compared

accounts for the increased number of middling incomes. These cannot, therefore, be balanced against the increase of very large incomes. On the contrary, they seem rather to be taking the place of moderate propertied incomes. But, if the growth of very large incomes is enough to outweigh the growth of the

with the increase of large fortunes, this is a strong indication of concentration of property and of income from property.

There has been of late, in fact, a very noteworthy increase in the salaried class relative not only to the number of entrepreneurs, but also to the number of "wage-earners." For the tendency in manufactures we need only to cite the figures of the latest United States Census of Manufactures, that for 1905. In the five-year period 1900 to 1905 salaried officials, clerks, etc., increased in number 42.7%, while the number of wage-earners increased but 16.0%. In the German statistics of occupations the class of *Angestellte* corresponds to our "salaried officials, clerks, etc." The number of these at the dates given was as follows (the data are as given by Zahn, Conrad's Handwörterbuch, ii, p. 604):—

	1882.	1895.	Absolute Increase.	Per Cent. Increase.
Landwirtschaft . . .	66,644	96,173	29,529	44
Industrie	99,076	263,745	164,669	166
Handel	141,548	261,907	120,359	85
Ueberhaupt . . .	307,268	621,825	314,557	102

The increase in the total number of persons occupied was 17.80 per cent. Entrepreneurs employing assistants increased, in the period from 1882 to 1895, 1.3 per cent.; laborers, 62.6 per cent.; officials, 118.9 per cent. (Schmoller, "Grundriss," p. 436.) The salaried class is clearly gaining ground, though the propertied middle class is losing. The connection of both of these tendencies with modern industrial developments is obvious.

These statistics suggest a line of thought and investigation, which, however, does not promise readily to lead to a positive issue. If the question be asked, how far the growth of the "great industry" directly and positively favors the increase of the middle class—as some seem to think it does—the difficulties in the way of arriving at a convincing conclusion are many. If would be necessary to know how the salaried class compares with the small-propertied class as regards economic condition, in particular how the different kinds of income, one kind being partly an income from goods, are to be weighted for comparison. Assuming that the two are to be accepted as equivalent middle classes, it would then be necessary to show that the salaried class was, as compared with the proportion of the small-propertied entrepreneurs to the total of those occupied in small-scale manufacturing, either a larger and not decreasing proportion of the total occupied in large-scale production or that it was as large a proportion and gaining ground. And, if the two members of the comparison are not constant in character, changes in their composition and income must be taken into account. The number of variables is not small.

The growth of the salaried class may yet be the means to the reinvigoration of a small or middle propertied class, owners, this time, of abstract property, that is, of bonds and other "securities." In power of saving, moderate incomes appear to have the advantage as regards subjective factors. On the objective side, too, in the field of investment, the evolution of abstract property appears to be putting the possessors of such income on the same plane with the possessors of large fortunes.

salaried class, the evidence of concentration is clear and strong. Recently Adolf Wagner has worked over the later and very reliable Prussian income statistics, with results given in the following table:—

Size of Income (Marks).	Prussia: Per Cent. Distribution of Incomes.*					
	1892.		1896.		1902.	
	Numbers.	Amounts.	Numbers.	Amounts.	Numbers.	Amounts.
Up to 900 . . . (tax free)	78.18	41.21	76.88	40.03	70.66	32.97
900 to 3,000 . .	18.98	30.01	20.23	31.50	25.83	34.92
3,000 to 30,500 .	2.74	20.20	2.79	19.99	3.38	21.57
Over 30,500 . .	0.10	8.58	0.10	8.47	0.12	10.54

	Incomes in Prussia in†							
	1892.				1902.			
	Numbers.		Amounts.		Numbers.		Amounts.	
	Absolute.	Per Cent.	Mil. M.	Per Cent.	Absolute.	Per Cent.	Mil. M.	Per Cent.
900– 3,000	2,118,969	86.99	2,912	51.05	3,309,696	88.04	4,460	52.10
3,000– 6,000	204,544	8.40	832	14.59	291,341	7.75	1,179	13.77
6,000– 9,500	55,561	2.28	413	7.24	77,636	2.07	575	6.72
9,500– 30,500	46,092	1.89	715	12.54	64,737	1.72	1,001	11.69
30,500– 100,000	9,034	0.37	451	7.91	13,205	0.35	655	7.65
100,000– 500,000	1,555	0.06	277	4.86	2,594	0.07	485	5.67
500,000–1,000,000	72	0.003	47	0.82	108	0.003	72	0.84
1,000,000–2,000,000	27	0.001	37	0.65	44	0.001	64	0.75
Over 2,000,000	4	0.0002	20	0.35	16	0.0004	69	0.81
Total of above	2,435,858		5,704		3,759,377		8,560	
Tax free . . .	8,726,215		3,998		9,053,608		4,211	
Grand total . .	11,162,073		9,702		12,812,985		12,771	

* *Zeitsch. des Preus. Statist. Bur.*, 1904, p. 255.

† *Ibid.*, p. 263. Like figures are given in the *Bul. Inst. Internat. de Statist.*, vol. xiv, Part III. Certain insignificant inconsistencies in the ratios above are in the original tables.

The gain of the class immediately above 900 marks in the ten years covered by the above statistics is very notable. The limit thus set for taxation is so low as to include not merely the salaried, but also some of the wage-labor class, which is also considerably increasing its income. Relative to all taxed incomes those of the middle classes are losing ground, despite the rapid increase of the salaried class. These statements are in terms of absolute income classes. But the average income is slightly lower at the later than at the earlier date, which makes a relative test not indispensable.* A comparison of the logarithms of the quantities involved of course rather strengthens the conclusion.†

The incomes taxed are unhomogeneous in character. It is impossible to separate incomes from labor from those from property, so as properly to weight the latter. The most exacting attention to the requirements of method cannot make up for these defects in the material. We can only refer to the known tendency towards an increase of the salaried classes, marked in Germany as elsewhere, and also, for these statistics, to the tendency towards higher money wages, as strengthening

* The facts that the average of incomes included is somewhat lower at the later than at the earlier date, and that the number included is a larger proportion of the population, suggest an increase of administrative efficiency. Which way this would affect the indications of the statistics as regards concentration, and how much, is a question. It looks as if there is no neglect of the smaller incomes. If increased adequacy is greatest here, the inference as to concentration is strengthened.

† Logarithms of numbers in income classes of 900 marks and above are:—

Size of Income as Large as	1892.		1902.	
	Numbers.	Log.	Numbers.	Log.
900 marks	2,435,858	6.387	3,759,377	6.575
3,000 "	316,889	5.501	449,681	5.653
6,000 "	112,345	5.050	158,340	5.200
9,500 "	56,784	4.754	80,704	4.907
30,500 "	10,692	4.029	15,967	4.203
100,000 "	1,858	3.269	2,762	3.441
1,000,000 "	103	2.013	168	2.225
2,000,000 "	31	1.491	60	1.778
	4	1.602	16	1.204

It is hardly necessary to plot these results.

the inference from the greater increase of the large incomes that there is concentration of *wealth*. It is these large incomes that are incomes from property. The actual fortunes are of course, if the interest rate is falling, increasing at a faster rate.

We should expect to find a reflection of the effects of the rapid industrialization of Germany in just these contemporary Prussian income statistics. The Berlin and Rhineland districts show the most pronounced tendency to concentration.* As regards the symptoms observable in other countries, pointing to a tendency toward a rehabilitation of the small-propertied class, such a tendency could hardly affect these statistics noticeably, and is perhaps less to be expected to show itself in Germany as yet on account of that country's being in an earlier stage of the abstract-property development.†

Only the most satisfactory bases of comparison and tests for the growth of fortunes have been used in the foregoing. Aside from lack of space, other methods, for example based upon statistics resulting from general property and house taxes and the like, are less accurate, as the data are even more impeachable than the above.

One point of general evidence, not of a statistical nature, may be added. Prices paid for curios and articles of luxury by the rich have enormously increased in the last two generations. Fine pictures and fine furniture, fine building sites and fine houses, have, wherever scarcity checks production and stimulates ambition, been bid up to astonishingly high prices. The buying of paintings of "old masters" and others by American

* See the article cited, *Bul. Inst. Internat.*

† British income statistics for Schedule D (that is, "profits from businesses, concerns, professions, employments," etc., classified by size) are often used as evidence of decreasing concentration of wealth (especially by Giffen and Goschen and by others following them). They show gains for middling incomes of the professional and salaried class, independent entrepreneurs, and the like. But they are not highly satisfactory material, since they are fractions of incomes, not the whole incomes of the persons entered (Report of Commissioners of Inland Revenue for 1902–03, p. 207), since they are also from the most unreliable of the schedules for accuracy (*Ibid.*, p. 173), and since they are affected by transfer into other classes (*Jour. Roy. Stat. Soc.*, 1888, p. 640). They are quite unsuited for our purposes, moreover, because the major portion of income from property, and especially abstract-property income, is entered under the other schedules.

millionaires in the last few years, at prices which competing European millionaires and princes could not afford to pay, is highly significant both of gratifying improvement in the ambitions of some of our multi-millionaires and of the fact that we possess the multi-millionaires.

The conclusion of this examination of the evidence relating to concentration of riches is: there has been, on the whole, in the last half-century or so, a tendency to concentration in the leading countries of the Occidental world. There appears to be more difference of opinion on this question than the evidence justifies, because the question of concentration of wealth is confused with that of concentration in the distribution of incomes. The poor are not getting poorer in the sense of receiving smaller incomes. Wages have demonstrably risen in the last half-century. But the concentration of wealth is a different question. Even in property the poor have, on the whole, probably gained absolutely. The question whether there has been enough rise in wages and salaries and enough absolute gain in property, both combined, to compensate or more than compensate for the relatively greater gains in property by the rich is irrelevant to our present purpose.

The situation, even when strictly confined to the question of concentration of wealth, is not without its encouraging features. The tendency is not so decisive, not even so unequivocal, as some would claim. Lately the small-propertied class may have been gaining in weight, relatively as well as absolutely. Their saving power is such, and most recently their opportunities of investment have so improved, that their set-back is perhaps only temporary. In manufactures and the like, where the critical field is, industrial organization is adapting itself to subdivided ownership.

That there has been a general tendency to a disproportionate growth of large fortunes in the last half-century is clearly established. This we should expect as the primary though not necessarily the ultimate effect of the modern régime in industry.

THE MEASUREMENT OF SOCIAL PRESSURE.

By Franklin H. Giddings.

Any massing of living organisms into local aggregates interferes in a degree with the freedom of action of each individual organism. The aggregation of human beings in communities occasions a relatively high degree of interference, because merely physical obstruction is supplemented by the restrictions of liberty that are imposed by psychological evolution. The thought and the will of each affects the conduct of all: the concerted will of many often restrains or coerces the behavior of any one or of a few.

Let us call the restraining or compelling power which the social aggregate imposes upon its units a social pressure. Is it possible to investigate social pressure by quantitative methods? Can we measure it? The purpose of this brief paper is to describe a method of obtaining index numbers of social pressure. I have been led to believe that it is quite as possible to determine relative intensities and changes of social pressure in different nations, commonwealths, or minor communities, as it is by the same general method to determine changes in the purchasing power of gold from time to time or from place to place.

In modern communities the social will finds definite expression in legislation, and social pressure is therefore most extensively and precisely exerted through the forms of law. Of these forms the statutes enacted by legislatures are relatively explicit, they admit of classification, and they can be counted. Penalties for non-observance also admit of numerical statement. With relatively few exceptions, they are fines, ranging from one dollar up, or terms of imprisonment for stated periods.

As expressions of social pressure, statutes fall naturally into the following classification. Some prohibit or deny, as, for example, an enactment forbidding a specified form of gambling

or forbidding the sale of intoxicating drinks. Some restrict, by establishing a State monopoly or otherwise, as, for example, the federal statutes creating a postal system. Some regulate, as, for example, statutes governing banking, insurance, or railway transportation. Under the first of these categories we may conveniently make as many as five subdivisions according to penalty. Under each of the other categories we may make the subdivisions "generally," and "local only." Adding to our categories the class "Unrestricted,"—that is to say, all acts or kinds of behavior that the State does not prohibit, restrict, or regulate, save in that minor degree which is described as "keeping the peace,"—we have a gradation from "Prohibited" down to "Unrestricted" of ten degrees, which may be designated by the numerals from ten down to one. In like manner the law may make certain acts or relations compulsory; it may create an agent or commission as an organ of government with power; or it may merely maintain or aid an enterprise at public cost. All remaining acts and relations may be classed as "Voluntary." The category "Compulsory" may be subdivided into five grades according to penalty, and the category "Established as an Organ of Government" may be subdivided into the grades "with maximum," "with medium," and "with minimum power." We may thus again get ten degrees of social pressure, which may be designated by numerals from ten down to one.

Using these gradation categories as column headings, we may then, as in the accompanying form, construct a table of legal provisions in force in any commonwealth, so as to show their significance as manifestations of social pressure.

It will be observed that the number entered against any item is the number that stands at the head of the column to which as a fact of classification the provision in question is properly assigned. The investigator, therefore, does not mark according to any subjective standard. The values are assigned in advance. He has only to be careful to avoid errors of classification, and his decisions can be checked by other investigators or by his readers, his data always being accessible.

SOCIAL PRESSURE: ILLUSTRATIVE TABULAR FORM.

Commonwealth X.	Prohibited or Denied, with Penalty.					Restricted, (by State Monopoly or otherwise) or Regulated.					Compulsory with Penalty.					Established, Maintained, or Encouraged.				
	Death or life imprisonment.	Prison, 1 year or more.	Prison or $500 or more.	Prison or $100 or more.	Prison or less than $100.	Restricted, generally.	Restricted, locally only.	Regulated, generally.	Regulated, locally only.	Unrestricted.	Death or life imprisonment.	Prison 1 year or more.	Prison or $500 or more.	Prison or $100 or more.	Prison or less than $100.	As organ of government, with maximum powers.	As organ of government, with medium powers.	As organ of government, with minimum powers.	Maintained or encouraged at public cost.	Voluntary.
	10	9	8	7	6	5	4	3	2	1	10	9	8	7	6	5	4	3	2	1
Social population:																				
Migration: foreign	–	–	–	–	–	5														
Migration: Inter-state	–	–	–	–	–	–	–	–	–	1										
Migration: Intra-state,	–	–	–	–	–	–	–	–	–	1										
Social mind:																				
Communication	–	–	–	–	–	–	–	–	–	1										
Meeting	–	–	–	–	–	–	–	–	2											
Discussion	–	–	–	–	–	–	–	–	–	1										
Publication	–	–	–	–	–	–	–	–	–	1										
Social organization:																				
Bigamy	–	–	8																	
License to marry	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6					
Trade union	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Railroad commission	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4			
Social welfare:																				
State University	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	
Old age pensions	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	
Totals	8		+ 5		+ 2+5			+ 6			+ 4		+ 4+1 = 35							
Index number	2,692																			

Footing the columns, obtaining the grand total, and dividing by the whole number of items marked, an arithmetical average is obtained which is similar in form to index numbers in general. May it be accepted as in fact an index number of social pressure for the Commonwealth described?

The most obvious objection is that the enactment of a law does not necessarily mean enforcement. If we had comprehensive and accurate statistics of prosecutions and convictions and of orders of injunction and mandamus, it would of course be desirable to subdivide our categories further, so as to show gradations of enforcement. Statistics of this kind, however, are notoriously defective, and an attempt to mark degrees of enforcement would introduce the uncertainties of subjective estimate.

I am satisfied that the objection itself is not a serious one. The community has other ways of enforcing its will which supplement the legal process. There is an immense amount of coercion which is exercised through public opinion, social favor or disfavor, and the conceding or withholding of business opportunity; and observation will, I think, confirm the judgment that, when the community or some interest in the community feels strongly enough upon any given subject to express its will in statute law, it can and does in a large measure enforce its decree in extra-legal ways, even when the statute itself is enforced but imperfectly. I conclude, then, that the actual enacting of a statute by a legislative body is, in practically every case, an index of actually existing social pressure.

It should be explained, perhaps, that this is true even when the pressure originates with a minority or even with a few individuals, since even then it is an actually disturbing influence affecting in some measure the liberty of all other individuals upon whom it impinges.

The simplest way to obtain such an index number as has been described would be to count up from the statute books all the acts of any category, for example, the category "Prohibited," and falling within a given range as to penalty, multiply this number by the grade number at the head of

the column, enter the product in the column, and so proceed with each subdivision of each category; that is to say, with each column. This method would have, however, the very serious objection that the investigator's procedure could not be followed and checked by his readers, and mistakes of classification and of counting could therefore pass undetected.

The method of full detail (that is, of entering at the left-hand margin of the table every item of legislative enactment) is open to the quite different objections that it is exceedingly cumbersome, and that it leaves much to be desired in respect of possible groupings of similar things, whereby the incidence of social pressure upon various phases of individual or of collective action might advantageously be exhibited.

I prefer, therefore, a scheme according to which a rather full list of items, grouped according to certain sociological categories, is presented in the left-hand margin of the table. Supplementing this list should be the items "All Other Prohibitions," "All Other Restrictions," "All Other Regulations," etc. The number corresponding to each of these items (*e.g.*, the number of "All Other Prohibitions" as counted) should be multiplied by the grade number at the top of the proper column, —penalties having been averaged,—and the product should be entered in the column.

The objection may be made to this last procedure, as it might be made to the method of complete detail, that in comparing one commonwealth with another we sometimes find that in one commonwealth prohibitions are itemized which in another commonwealth are brought under one general prohibition. We, therefore, might have three or four entries of any given number in one table, and in another table only one entry, the facts being substantially the same in the two cases, except in respect of one point, statutory detail. I am disposed to think that this complication does not vitiate the procedure, because I believe that the specific itemizing of legal commands is itself usually an index of social pressure; that is to say, it is usually a higher degree of social pressure which makes detailed or specific prohibitions or demands, instead of general ones.

There is one final and important reason for making any such table rather detailed. Having a large number of numerical entries in the columns, we may advantageously obtain all deviations, item by item, from the mode and from our final average or index number, and get the standard deviations. These, showing the degree of closeness of clustering about the average and the mode, are index numbers of some value, inasmuch as it is a generally accepted corollary of the principle of evolution that variation from type diminishes with increasing environmental pressure upon the type. In terms of social causation, this means that increasing social pressure, manifesting itself in law, tends to create uniformity of conduct. Some indication of the extent to which this actually happens should be afforded by the standard deviations.

I hope in a subsequent paper to present a number of detailed tables, with actual index numbers of social pressure, for certain American commonwealths, and in connection with them to touch upon various questions of interpretation.

THE BILL FOR THE THIRTEENTH CENSUS.

By Walter F. Willcox.

The most important piece of legislation regarding the Federal Census between the insertion in the Constitution of the provision requiring a census and the present time is the law passed in 1899, providing for the Twelfth Census of the United States. The Censuses of 1880 and 1890 had been so overloaded with subsidiary investigations that both the accuracy and the speed of the fundamental census inquiries had been impaired. The law of 1899 divided all inquiries which theretofore had been taken in connection with a decennial census into two classes, those requiring the assistance of the army of Federal enumerators appointed every ten years, and those not requiring such cooperation. The former class included only the census of population, of deaths, of farms, and of manufacturing establishments. The latter class included all other census inquiries. The law of 1899 required the inquiries of the former class to be pushed to completion before any inquiries of the latter class were begun, and set a date—July 1, 1902—at which the inquiries of the first class must be finished. These instructions were carried out by the Census Office, and the main results of the census proper were given to the public with a speed previously unknown. But this legislation incidentally paved the way for the establishment of a permanent Census Office,—a step which was taken in 1902. That office was charged with carrying on the inquiries which at previous censuses had been taken in connection with the decennial count, but which had been postponed under the legislation of 1899 until after the census proper was finished. The permanent Census Office, established in 1902, has been engaged from that time to the present largely in the prosecution of inquiries which have heretofore been taken as a part of a decennial census. Such inquiries include the Report on Wealth, Debt, and Taxation (1907); a continua-

tion of the volumes on the same subject included in the Census of 1880 and 1890; the Census of the Defective, Dependent, and Delinquent Classes,—namely, the Blind and Deaf (1906); the Insane and Feeble-minded (1906); Benevolent Institutions (1905); Paupers in Almshouses (1906); Prisoners and Juvenile Delinquents (1907); and a Report on Mines and Quarries (1902). A Census of Religious Bodies, continuing the volume on the Statistics of Churches, published as a part of the Census of 1890, is now in progress. All these inquiries have been heretofore taken as part of a decennial census.

It is unnecessary to mention here also the large number of additional inquiries which have been ordered by Congress and assigned to the Census Office. Investigations of this nature are frequently needed; and, had there been no permanent Census Office, they probably would have been undertaken by the Bureau of Labor or some other agency.

The bill recently reported by the Committee on the Census of the House of Representatives follows in all essentials the original changes introduced by the law of 1899. Like that law, it limits the enumeration strictly to four subjects, relegating other decennial inquiries to the interval between the censuses. One of the inquiries of 1899, that into deaths in the general population, has been dropped. The reasons are twofold. Fifty years of experiment from 1850 to 1900 has established with certainty the fact that not more than seven-tenths of all the deaths which occur in a given community during a year can be obtained by enumerators asking at the close of that year of each family a report of any deaths which had occurred therein during the preceding twelve months. Tables so imperfect have very little statistical or medical value, and are constantly misunderstood by the public. So wide a margin of error in one branch of the census tends also to discredit more accurate results reached in other divisions. Furthermore, the Federal Census, acting in co-operation with the states and cities having trustworthy local registers of deaths, is now annually publishing returns for about one-half the population of the country, which probably cover 95 per cent. of all deaths occurring within that region,

and furnish a far better index to the death-rate in the whole country than enumerators' returns for the United States could do.

While this inquiry into deaths outside the registration area is likely to be discontinued, it is proposed to add one other inquiry,—that into mines and mining. This is done because the past experience of the Census Office shows that the line between manufacturing, on the one hand, and mining or quarrying, on the other, is one almost impossible for the Census Office to draw, and that the difficulties in doing so are steadily increasing.

Like the law of 1899, the present draft requires the results of the census to be published by the summer of 1912, and thus prohibits the office from extending its publications into the seventh or eighth year after the census day, as had been done at certain previous censuses.

When the law of 1899 was under discussion, a radical difference of opinion developed between the Senate and the House of Representatives. The House, feeling convinced that the delays in completing and publishing the results of the Censuses of 1880 and 1890 had been due in large measure to a lack of authority and independent control exercised by the Superintendent of the Census and to his inability to secure action from his superior officer in many cases with the promptness which the emergency demanded, was insistent that the Census Office should be made entirely independent of any member of the Cabinet and responsible only to the President. In this position they had the hearty and general support of statistical experts throughout the country and of all who had had previous experience in census work.

In the Senate the bill as originally offered by the Committee on the Census had contained a similar provision, but it had been so amended in the course of discussion as to place the Census Office under the Secretary of the Interior. This was the main difference which produced a disagreement between the two Houses and resulted in a conference on the bill. Through that agency a compromise was made whereby the Census Office was left within the Department of the Interior, but given a far

greater degree of autonomy than is usual for administrative bureaus. The Director of the Census appointed all his subordinates except the Assistant Director, had his own disbursing office, controlled directly his own printing, and possessed thus a very high degree of independence. On the other hand, he reported annually to the Secretary of the Interior, transmitted his requests for appropriations to that officer for Congress, and in minor respects was subject to his control and supervision.

In this respect, as in all others of the first importance, the pending bill follows the precedent established in 1899. It is not surprising that the Secretary of Commerce and Labor, to whose department the Census Office was transferred in 1903, believes that its relation to his department should be analogous to that of the other bureaus. In a letter dated February 7, 1908, addressed to the Chairman of the Committee on the Census of the House of Representatives,* the Secretary writes, "It places a chief of a bureau within the Department of Commerce and Labor upon a footing practically independent of the supervisory jurisdiction of the head of the Department, which is a departure from a well-established plan of organization of the Executive Departments of the Government, and, in my judgment, will lead to undesirable and unsatisfactory results."

In another part of the same letter he adds that it "would constitute an administrative anomaly, which, it is believed, it is not the purpose of Congress to create."

There is no doubt that such an organization is, as the Secretary calls it, "a departure from a well-established plan of organization" and also an "administrative anomaly"; but the compromise thus established in 1899 was found to be satisfactory. The traditional method of organization which had been followed by the laws of 1879 and 1889 had proved unsatisfactory and practically unworkable. It is the belief of every one who has had practical experience with census work that the conditions themselves are anomalous, and that their requirements cannot be met by following administrative routine in this particular.

*Hearings before the Committee on the Census of the House of Representatives, pp. 97–101.

The law of 1899 gave the Census Office for the first time that degree of initiative and autonomy which the rigid requirements of its emergency work made necessary. Experience has shown that the Director of the Census must be given somewhat the same independence that is accorded to a general commanding an entire army in time of war. It is to be hoped that the precedent of 1899 will commend itself to the deliberate judgment of Congress, and be followed in the bill now before it for consideration.

Probably the most important new feature in the draft of the Census Bill is the provision for an almost automatic transfer of the Census Office from a status closely approaching that of the ordinary bureau, which it maintains during the seven years intervening between the decennial censuses, to the unusual condition requisite during the three years when the decennial census is being taken. The period from July 1, 1909, to July 1, 1912, is named the decennial census period. During that period the law provides for an Assistant Director, a fifth Chief Statistician, and such other clerks of various classes as may be found necessary. During that period also the Director of the Census may promote or transfer persons from the temporary roll of employees holding office only during the decennial period to the permanent force and *vice versa*. The whole office works thus as one organization, its energies and personnel being devoted in part to the decennial census, in part to the routine work of the permanent office, as the needs of the work require. The funds, like the personnel, are entirely under the control of the Director. During those three years there are no annual appropriations for any work of the office, but all its expenses are to be met out of a single lump appropriation. For the three years a sum of $14,000,000 is provided. During this period the responsibility and the initiative are concentrated in the hands of the Director, and he is solely responsible for the rapid and effective progress of the work. The work of the decennial census must be completed by the end of this decennial census period, and the office then returns to its normal condition. The temporary employees having no standing on the Civil

Service roll lose their positions in 1912, and the office reverts to what may be called a peace footing.

It is proposed to change the census day from June 1 to April 15. June 1 is so late in the summer that many persons have left their usual places of residence, their houses are closed, and it is extremely difficult to obtain information about them either from the neighbors or by correspondence. This source of danger and of error to a census is increasing with each decade. If a census can be taken in Canada in April, as it has been for decades past, there seems no reason to believe that this date would furnish insurmountable difficulties to the field work in the United States; and there is no doubt that April 15 is a far better date than June 1. It is probably also better than any other date which has been suggested.

These are the main features of statistical rather than of administrative importance embodied in the bill in its present form. A copy of that draft is appended for comparison with the law in the form in which it shall be finally passed. The copy is that of the Crumpacker Bill as reported by the Committee on the Census to the House of Representatives on Feb. 17, 1908.

A BILL

TO PROVIDE FOR THE THIRTEENTH AND SUBSEQUENT DECENNIAL CENSUSES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a census of the population, agriculture, manufactures, and mines and quarries of the United States shall be taken by the Director of the Census in the year nineteen hundred and ten and once every ten years thereafter. The census herein provided for shall include each State and Territory on the mainland of the United States, the District of Columbia, and the Territories of Alaska, Hawaii, and Porto Rico, and Guam, Samoa, and the Panama Canal Zone.

SEC. 2. That the period of three years beginning the first day of July next preceding the census provided for in section one of this Act shall be known as the decennial census period, and the reports upon the inquiries provided for in said section shall be completed and published within such period.

SEC. 3. That after June thirtieth, nineteen hundred and nine, there may be employed in the Census Office, in addition to the force provided for by the Act of March sixth, nineteen hundred and two, entitled "An Act to provide for a permanent Census Office," an Assistant Director, who shall be an experienced practical statistician; a chief statistician, who shall be a person of known and tried experience in statistical work, an appointment clerk, a private secretary to the Director, two stenographers, and eight expert chiefs of division. These officers, with the exception of the Assistant Director, shall be appointed without examination by the Secretary of Commerce and Labor upon the recommendation of the Director of the Census. The Assistant Director shall be appointed by the President, by and with the advice and consent of the Senate.

SEC. 4. That the Assistant Director shall perform such duties as may be prescribed by the Director of the Census. In the absence of the Director the Assistant Director shall serve as Director, and in the absence of the Director and Assistant Director the chief clerk shall serve as Director.

The appointment clerk shall perform the appointment duties assigned to the disbursing clerk in section four of the Act entitled "An Act to provide for a permanent Census Office," approved March sixth, nineteen hundred and two. The disbursing clerk of the Census Office shall, at the beginning of the decennial census period, give additional bond to the Secretary of the Treasury in the sum of one hundred thousand dollars, surety to be approved by the Solicitor of the Treasury, which bond shall be conditioned that the said officer shall render, quarter yearly, a true and faithful account to the proper accounting officers of the Treasury of all moneys and properties which shall be received by him by virtue of his office during the said decennial census period. Such bond shall be filed in the office of the Secretary of the Treasury, to be by him put in suit upon any breach of the conditions thereof.

SEC. 5. That during the decennial census period the annual compensation of the officials of the Census Office shall be as follows: The Director of the Census, seven thousand five hundred dollars; the private secretary to the Director, two thousand five hundred dollars; the Assistant Director, five thousand dollars; the chief statisticians, three thousand five hundred dollars each; the chief clerk, three thousand dollars; the disbursing clerk, three thousand dollars; the appointment clerk, three thousand dollars; the geographer, two thousand seven hundred and fifty dollars; the chiefs of division, two thousand two hundred and fifty dollars each; and the stenographers provided for in section three of this Act, two thousand dollars each.

SEC. 6. That in addition to the force hereinbefore provided for and to that already authorized by law there may be employed in the Census Office

during the decennial census period, and no longer, as many clerks of classes four, three, two, and one; as many clerks, copyists, computers, and skilled laborers, with salaries at the rate of not less than six hundred dollars nor more than one thousand dollars per annum, and as many messengers, assistant messengers, messenger boys, watchmen, unskilled laborers, and charwomen, as may be found necessary for the proper and prompt performance of the duties herein required, these additional clerks and employees to be appointed by the Director of the Census: *Provided*, That the total number of such additional clerks of classes two, three, and four shall at no time exceed one hundred: *And provided further*, That employees engaged in the compilation or tabulation of statistics by the use of mechanical devices may be compensated on a piece-price basis to be fixed by the Director.

SEC. 7. That the additional clerks and other employees provided for in section six shall be subject to such noncompetitive examination as the Director of the Census may prescribe, the said examination to be conducted by the United States Civil Service Commission: *Provided*, That they shall be selected without regard to the law of apportionment or to the political party affiliations of the applicants, and that preference may be given to persons having previous experience in census work whose efficiency records are satisfactory to the said Director, who may, in his discretion, accept such records in lieu of said examination: *And provided further*, That employees in other branches of the departmental service who have had previous experience in census work may be transferred without examination to the Census Office to serve during the whole or a part of the decennial census period, and at the end of such service the employees so transferred shall be eligible to appointment to positions of similar grade in any Department without examination: *And provided further*, That during the decennial census period and no longer the Director of the Census may fill vacancies in the permanent force of the Census Office by the promotion or transfer of clerks or other employees employed on the temporary force authorized by section six of this Act: *And provided further*, That at the expiration of the decennial census period the term of service of all employees so transferred and of all other temporary officers and employees appointed under the provisions of this Act shall terminate, and such officers and employees shall not thereafter be eligible to appointment or transfer into the classified service of the Government by virtue of their examination or appointment under this Act.

SEC. 8. That the Thirteenth Census shall be restricted to inquiries relating to population, to agriculture, to manufactures, and to mines and quarries. The schedules relating to population shall include for each inhabitant the name, relationship to head of family, color, sex, age, conjugal condition, place of birth, place of birth of parents, number of

years in the United States, citizenship, occupation, school attendance, literacy, and tenure of home

The schedules relating to agriculture shall include name of occupant of each farm, color of occupant, tenure, acreage of farm, value of farm and improvements, value of farm implements, number and value of live stock on farms and ranges, number and value of domestic animals not on farms and ranges, and the acreage of crops as of the date of enumeration, and the acreage of crops and the quantity and value of crops and other farm products for the year ending December thirty-first next preceding the enumeration.

The schedules of inquiries relating to manufactures and to mines and quarries shall include the name and location of each establishment; character of organization, whether individual, co-operative, or other form; character of business or kind of goods manufactured; amount of capital invested; number of proprietors, firm members, copartners, stockholders, and officers and the amount of their salaries; number of employees and the amount of their wages; quantity and cost of materials used in manufactures; amount of miscellaneous expenses; quantity and value of products; time in operation during the census year; character and quantity of power used, and character and number of machines employed.

The census of manufactures and of mines and quarries shall relate to the year ending December thirty-first next preceding the enumeration of population and shall be confined to mines and quarries and manufacturing establishments which were in active operation during all or a portion of that year and had a product valued at five hundred dollars or more. The census of manufactures shall furthermore be confined to manufacturing establishments conducted under what is known as the factory system, exclusive of the so-called neighborhood or household industries.

Whenever he shall deem it expedient, the Director of the Census may charge the collection of these statistics upon the special agents or upon detailed employees, to be employed without respect to locality.

The form and subdivision of inquiries necessary to secure the information under the foregoing topics shall be determined by the Director of the Census.

SEC. 9. That the Director of the Census shall, at least one year prior to the date fixed for commencing the enumeration at the Thirteenth and each succeeding decennial census, designate the number, whether one or more, of supervisors of census for each State and Territory, the District of Columbia, Alaska, the Hawaiian Islands, Porto Rico, Guam, Samoa, and the Panama Canal Zone, and shall define the districts within which they are to act. The supervisors shall be appointed by the President, by and with the advice and consent of the Senate: *Provided*, That the whole number of supervisors shall not exceed three hundred and thirty:

And provided further, That so far as practicable and desirable the boundaries of the supervisors' districts shall conform to the boundaries of the Congressional districts: *And provided further*, That if in any supervisor's district the supervisor has not been appointed and qualified ninety days preceding the date fixed for the commencement of the enumeration, or if any vacancy shall occur thereafter, either through death, removal, or resignation of the supervisor, or from any other cause, the Director of the Census may appoint a temporary supervisor or detail an employee of the Census Office to act as supervisor for that district.

SEC. 10. That each supervisor of census shall be charged with the performance, within his own district, of the following duties: To consult with the Director of the Census in regard to the division of his district into subdivisions most convenient for the purpose of the enumeration, which subdivisions or enumeration districts shall be defined and the boundaries thereof fixed by the Director of the Census; to designate to the Director suitable persons, and, with his consent, to employ such persons as enumerators, one or more for each subdivision; to communicate to enumerators the necessary instructions and directions relating to their duties; to examine and scrutinize the returns of the enumerators, and in the event of discrepancies or deficiencies appearing in any of the said returns to use all diligence in causing the same to be corrected or supplied; to forward the completed returns of the enumerators to the Director at such time and in such manner as shall be prescribed, and to make up and forward to the Director the accounts of each enumerator in his district for service rendered, which accounts shall be duly certified to by the enumerator, and the same shall be certified as true and correct, if so found, by the supervisor, and said accounts so certified shall be accepted and paid by the Director. The duties imposed upon the supervisor by this Act shall be performed in any and all particulars in accordance with the orders and instructions of the Director of the Census.

SEC. 11. That each supervisor of the census shall, upon the completion of his duties to the satisfaction of the Director of the Census, receive a sum based upon the population of his district, in accordance with the following rates for each thousand or major fraction of a thousand: One dollar and fifty cents per thousand in each district having more than seven hundred and fifty thousand inhabitants; two dollars per thousand in each district having five hundred thousand to seven hundred and fifty thousand inhabitants; two dollars and fifty cents per thousand in each district having four hundred thousand to five hundred thousand inhabitants; three dollars per thousand in each district having three hundred thousand to four hundred thousand inhabitants; three dollars and fifty cents per thousand in each district having two hundred thousand to three hundred thousand inhabitants; and four dollars per thousand in

each district having less than two hundred thousand inhabitants. In addition to such compensation each supervisor shall receive the sum of five hundred dollars, which sum, in the discretion of the Director of the Census, may be paid to any supervisor prior to the completion of his duties in one or more payments, as the Director of the Census may determine, such sums to be in full compensation for all services rendered and expenses incurred by him: *Provided*, That if the aggregate compensation of any supervisor as herein provided for amounts to less than one thousand two hundred dollars the Director of the Census shall pay such supervisor a sum sufficient to make his compensation amount to one thousand two hundred dollars: *Provided further*, That in emergencies arising in connection with the work of preparation for, or during the progress of, the enumeration in his district, or in connection with the re-enumeration of any subdivision, a supervisor may, in the discretion of the Director of the Census, be allowed actual and necessary travelling expenses and an allowance in lieu of subsistence not exceeding four dollars per day during his necessary absence from his usual place of residence: *And provided further*, That an appropriate allowance to supervisors for clerk hire may be made when deemed necessary by the Director of the Census.

SEC. 12. That each enumerator shall be charged with the collection in his subdivision of the facts and statistics required by the population and agricultural schedules and such other schedules as the Director of the Census may determine shall be used by him in connection with the census, as provided in section eight of this Act. It shall be the duty of each enumerator to visit personally each dwelling house in his subdivision, and each family therein, and each individual living out of a family in any place of abode, and by inquiry made of the head of each family, or of the member thereof deemed most competent and trustworthy, or of such individual living out of a family, to obtain each and every item of information and all particulars required by this Act as of date April fifteenth of the year in which the enumeration shall be made; and in case no person shall be found at the usual place of abode of such family, or individual living out of a family, competent to answer the inquiries made in compliance with the requirements of this Act, then it shall be lawful for the enumerator to obtain the required information as nearly as may be practicable from families or persons living in the neighborhood of such place of abode. It shall be the duty also of each enumerator to forward the original schedules, properly filled out and duly certified, to the supervisor of his district as his returns under the provisions of this Act; and in the event of discrepancies or deficiencies being discovered in these schedules he shall use all diligence in correcting or supplying the same. In case an enumeration district embraces all or any part of any incorporated borough, village, town, or city, and also other territory not

included within the limits of such incorporated borough, village, town, or city, it shall be the duty of the enumerator to clearly and plainly distinguish and separate, upon the population schedules, the inhabitants of such borough, village, town, or city from the inhabitants of the territory not included therein. No enumerator shall be deemed qualified to enter upon his duties until he has received from the supervisor of the district to which he belongs a commission, signed by the supervisor, authorizing him to perform the duties of an enumerator, and setting forth the boundaries of the subdivision within which such duties are to be performed.

SEC. 13. That the territory assigned to each supervisor shall be divided into as many enumeration districts as may be necessary to carry out the purposes of this Act and, in the discretion of the Director of the Census, two or more enumeration districts may be given to one enumerator, but the district, or districts, assigned to any enumerator shall not include more than two thousand inhabitants, according to estimates based on the preceding census or other reliable information, and the boundaries of all the enumeration districts shall be clearly described by civil divisions, rivers, roads, public surveys, or other easily distinguishable lines: *Provided*, That enumerators may be assigned for the special enumeration of institutions, when desirable, without reference to the number of inmates.

SEC. 14. That any supervisor of census may, with the approval of the Director of the Census, remove any enumerator in his district and fill the vacancy thus caused or otherwise occurring. Whenever it shall appear that any portion of the census provided for in this Act has been negligently or improperly taken, and is by reason thereof incomplete or erroneous, the Director of the Census may cause such incomplete and unsatisfactory enumeration and census to be amended or made anew.

SEC. 15. That the Director of the Census may authorize and direct supervisors of census to employ interpreters to assist the enumerators of their respective districts in the enumeration of persons not speaking the English language, but no authorization shall be given for such employment in any district until due and proper effort has been made to secure an enumerator who can speak the language or languages for which the services of an interpreter would otherwise be required. The compensation of such interpreters shall be fixed by the Director of the Census in advance, and shall not exceed five dollars per day for each day actually and necessarily employed.

SEC. 16. That the compensation of enumerators shall be determined by the Director of the Census as follows: In subdivisions where he shall deem such remuneration sufficient, an allowance of not less than two nor more than four cents for each inhabitant; not less than twenty nor more

than thirty cents for each farm reported; ten cents for each barn and inclosure containing live stock not on farms, and not less than twenty nor more than thirty cents for each establishment of productive industry. In other subdivisions per diem rates shall be fixed by the Director according to the difficulty of enumeration, having special reference to the regions to be canvassed and the sparsity of settlement or other considerations pertinent thereto. The compensation allowed to an enumerator in any such district shall be not less than three nor more than six dollars per day of eight hours actual field work, and no payment shall be made for time in excess of eight hours for any one day. The subdivisions or enumeration districts to which the several rates of compensation shall apply shall be designated by the Director of the Census at least two weeks in advance of the enumeration. No claim for mileage or travelling expenses shall be allowed any enumerator in either class of subdivisions, except in extreme cases, and then only when authority has been previously granted by the Director of the Census; and the decision of the Director as to the amount due any enumerator shall be final.

SEC. 17. That in the event of the death of any supervisor or enumerator after his appointment and entrance on his duties, the Director of the Census is authorized to pay to his widow or his legal representative such sum as he may deem just and fair for the services rendered by such supervisor or enumerator.

SEC. 18. That special agents may be appointed by the Director of the Census to carry out the provisions of this Act and of the Act to provide for a permanent Census Office approved March sixth, nineteen hundred and two, and Acts amendatory thereof or supplemental thereto. The special agents thus appointed shall have like authority with the enumerators in respect to the subjects committed to them under this Act, and shall receive compensation at rates to be fixed by the Director of the Census: *Provided*, That the same shall in no case exceed six dollars per day and actual necessary travelling expenses, and an allowance in lieu of subsistence not exceeding four dollars per day during necessary absence from their usual place of residence: *Provided further*, That no pay or allowance in lieu of subsistence shall be allowed special agents when employed in the Census Office on other than the special work committed to them, and no appointments of special agents shall be made for clerical work: *And provided further*, That the Director of the Census shall have power, and is hereby authorized, to appoint special agents to assist the supervisors whenever he may deem it proper, in connection with the work of preparation for, or during the progress of, the enumeration or in connection with the re-enumeration of any district or a part thereof; or he may, in his discretion, employ for this purpose any of the permanent or temporary employees of the Census Office: *And provided further*,

That the Director of the Census may, in his discretion, fix the compensation of special agents on a piece-price basis.

SEC. 19. That every supervisor, supervisor's clerk, enumerator, interpreter, special agent, or other employee shall take and subscribe to an oath or affirmation, to be prescribed by the Director of the Census. All appointees and employees provided for in this Act shall be appointed or employed, and examined, if examination is required by this Act, solely with reference to their fitness to perform the duties required of them by the provisions of this Act, and without reference to their political party affiliations.

SEC. 20. That the enumeration of the population required by section one of this Act shall be taken as of the fifteenth day of April; and it shall be the duty of each enumerator to commence the enumeration of his district on that day, unless the Director of the Census in his discretion shall defer the enumeration in said district by reason of climatic or other conditions which would materially interfere with the proper conduct of the work; but in any event it shall be the duty of each enumerator to prepare the returns hereinbefore required to be made, and to forward the same to the supervisor of his district, within thirty days from the commencement of the enumeration of his district: *Provided*, That in any city having five thousand inhabitants or more under the preceding census the enumeration of the population shall be commenced on the fifteenth day of April aforesaid and shall be completed within two weeks thereafter.

SEC. 21. That if any person shall receive or secure to himself any fee, reward, or compensation as a consideration for the appointment or employment of any person as enumerator or clerk or other employee, or shall in any way receive or secure to himself any part of the compensation paid to any enumerator or clerk or other employee, he shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not more than three thousand dollars and be imprisoned not more than five years.

SEC. 22. That any supervisor, supervisor's clerk, enumerator, interpreter, special agent, or other employee, who, having taken and subscribed the oath of office required by this Act, shall, without justifiable cause, neglect or refuse to perform the duties enjoined on him by this Act, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not exceeding five hundred dollars; or if he shall, without the authority of the Director of the Census, publish or communicate any information coming into his possession by reason of his employment under the provisions of this Act, or the Act to provide for a permanent Census Office, or Acts amendatory thereof or supplemental thereto, he shall be guilty of a misdemeanor and shall upon conviction thereof

be fined not to exceed one thousand dollars, or be imprisoned not to exceed two years, or both so fined and imprisoned, in the discretion of the court; or if he shall wilfully and knowingly swear to or affirm falsely he shall be deemed guilty of perjury, and upon conviction thereof shall be imprisoned not exceeding five years and be fined not exceeding two thousand dollars; or if he shall wilfully and knowingly make a false certificate or a fictitious return, he shall be guilty of a misdemeanor, and upon conviction of either of the last-named offenses he shall be fined not exceeding two thousand dollars and be imprisoned not exceeding five years; or if any person who is or has been an enumerator shall knowingly or wilfully furnish, or cause to be furnished, directly or indirectly, to the Director of the Census, or to any supervisor of the census, any false statement or false information with reference to any inquiry for which he was authorized and required to collect information, he shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not exceeding two thousand dollars and be imprisoned not exceeding five years.

SEC. 23. That it shall be the duty of all persons over twenty-one years of age when requested by the Director of the Census, or by any supervisor, enumerator, or special agent, or other employee of the Census Office, acting under the instructions of the said Director, to answer correctly, to the best of their knowledge, all questions on the census schedules applying to themselves and to the family to which they belong or are related, and to the farm or farms of which they or their families are the occupants; and any person over twenty-one years of age who, under the conditions hereinbefore stated, shall refuse or wilfully neglect to answer any of these questions, or shall wilfully give answers that are false, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not exceeding one hundred dollars.

And it shall be the duty of every owner, proprietor, manager, superintendent, or agent of a hotel, apartment house, boarding or lodging house, tenement, or other building, when requested by the Director of the Census, or by any supervisor, enumerator, special agent, or other employee of the Census Office, acting under the instructions of the said Director, to furnish the names of the occupants of said hotel, apartment house, boarding or lodging house, tenement, or other building, and to give thereto free ingress and egress to any duly accredited representative of the Census Office, so as to permit of the proper and correct enumeration of all persons having their usual place of abode in said hotel, apartment house, boarding or lodging house, tenement, or other building; and any owner, proprietor, manager, superintendent, or agent of a hotel, apartment house, boarding or lodging house, tenement, or other building who shall refuse or wilfully neglect to give such information

or assistance under the conditions hereinbefore stated shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not exceeding five hundred dollars.

SEC. 24. And it shall be the duty of every owner, president, treasurer, secretary, director, or other officer or agent of any manufacturing establishment, mine, quarry, or other establishment of productive industry, whether conducted as a corporation, firm, limited liability company, or by private individuals, when requested by the Director of the Census or by any supervisor, enumerator, special agent, or other employee of the Census Office, acting under the instructions of the said Director, to answer completely and correctly to the best of his knowledge all questions on any census schedule applying to such establishment; and any owner, president, secretary, director, or other officer or agent of any manufacturing establishment, mine, quarry, or other establishment of productive industry, who under the conditions hereinbefore stated shall refuse or wilfully neglect to answer any of these questions, or shall wilfully give answers that are false, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not exceeding ten thousand dollars, or imprisoned for a period not exceeding one year, or both so fined and imprisoned, at the discretion of the court. The provisions of this section shall also apply to the collection of the information required and authorized by the Act entitled "An Act to provide for a permanent Census Office," and by Acts amendatory thereof or supplemental thereto.

SEC. 25. That the information furnished under the provisions of the next preceding section shall be used only for the statistical purposes for which it is supplied. No publication shall be made by the Census Office whereby the data furnished by any particular establishment can be identified, nor shall the Director of the Census permit any one other than the sworn employees of the Census Office to examine the individual reports.

SEC. 26. That all fines and penalties imposed by this Act may be enforced by indictment or information in any court of competent jurisdiction.

SEC. 27. That the Director of the Census may authorize the expenditure of necessary sums for the actual and necessary travelling expenses of the officers and employees of the Census Office, including an allowance in lieu of subsistence not exceeding four dollars per day during their necessary absence from the Census Office, or, instead of such an allowance, their actual subsistence expenses, not exceeding five dollars per day; and he may authorize the incidental, miscellaneous, and contingent expenses necessary for the carrying out of this Act, as herein provided, and not otherwise, including advertising in newspapers, the purchase of books of reference and periodicals, the rental of sufficient quarters in the

District of Columbia or elsewhere and the furnishing thereof, and expenditures necessary for the compiling, printing, publishing, and distributing the results of the census, and purchase of necessary paper and other supplies, the purchase, rental, construction, and repair of mechanical appliances, the compensation of such permanent and temporary clerks as may be employed under the provisions of this Act and the Act establishing the permanent Census Office and Acts amendatory thereof or supplemental thereto, and all other expenses incurred under authority conveyed in this Act.

SEC. 28. That the Director of the Census is hereby authorized to make requisition upon the Public Printer for such printing as may be necessary to carry out the provisions of this Act, to wit: Blanks, schedules, circulars, pamphlets, envelopes, work sheets, and other items of miscellaneous printing; that he is further authorized to have printed by the Public Printer, in such editions as the Director may deem necessary, preliminary and other Census bulletins, and final reports of the results of the several investigations authorized by this Act, or by the Act to establish a permanent Census Office and Acts amendatory thereof or supplemental thereto, and to publish and distribute said bulletins and reports.

SEC. 29. That all mail matter, of whatever class, relating to the census and addressed to the Census Office, or to any official thereof, and indorsed "Official business, Census Office," shall be transmitted free of postage, and by registered mail if necessary, and so marked: *Provided*, That if any person shall make use of such indorsement to avoid the payment of postage or registry fee on his or her private letter, package, or other matter in the mail, the person so offending shall be guilty of a misdemeanor and subject to a fine of three hundred dollars, to be prosecuted in any court of competent jurisdiction.

SEC. 30. That the Secretary of Commerce and Labor, whenever he may deem it advisable, or on request of the Director of the Census, is hereby authorized to call upon any other department or office of the Government for information pertinent to the work herein provided for.

SEC. 31. That there shall be in the year nineteen hundred and fifteen, and once every ten years thereafter, a census of agriculture and live stock, which shall show the acreage of farm land, the acreage of the principal crops, and the number and value of domestic animals on the farms and ranges of the country. The schedule employed in this census shall be prepared by the Director of the Census. Such census shall be taken as of October first, and shall relate to the current year. The Director of the Census may appoint enumerators or special agents for the purpose of this census, in accordance with the provisions of the permanent Census Act.

SEC. 32. That the Director of the Census is hereby authorized, at

his discretion, upon the written request of the governor of any State or Territory, or of a court of record, to furnish such governor or court of record with certified copies of so much of the population returns as may be requested, upon the payment of the actual cost of making such copies, and one dollar additional for certification; and that the Director of the Census is further authorized, in his discretion, to furnish to individuals such data from the population schedules as may be desired for genealogical or other proper purposes, upon payment of the actual cost of searching the records and one dollar for supplying a certificate; and the amounts so received shall be covered into the Treasury of the United States, to be placed to the credit of, and in addition to, the appropriations made for taking the census.

SEC. 33. That the Act establishing the permanent Census Office, approved March sixth, nineteen hundred and two, and Acts amendatory thereof and supplemental thereto, except as are herein amended, shall remain in full force. That the Act entitled "An Act to provide for taking the Twelfth and subsequent censuses," approved March third, eighteen hundred and ninety-nine, and all other laws and parts of laws inconsistent with the provisions of this Act are hereby repealed.

NOTES ON THE FINANCIAL PANIC OF 1907.

By Francis B. Forbes.

The accompanying tables give a condensed record, between January 1907, and January 1908, of the New York quotations for eight railroad and eight industrial stocks. It is by no means claimed that these special stocks represent an average of everything listed by the New York Stock Exchange, since the only reason for their selection, early in the critical period, was that they were all ranked as steady dividend payers. On the other hand, as the outstanding stock capital of the eight railroad companies aggregates some $1,778,000,000, and that of the eight industrials some $1,329,000,000 (including Calumet and Hecla at the nominal par value of only $2,500,000), it can be seen that the figures of these few stocks must have an undoubted significance. And it must be remembered that, if the stock capital of all the subsidiary companies leased or controlled by the sixteen in our list had been included, the aggregate would have been even more imposing.

Table A, for Railroads, and Table B, for Industrials, give the following facts for each stock:—

(1) The *highest quotations* in 1907, which were all in the month of January (except Calumet and Hecla in February).

(2) The *lowest quotations* during the crisis, ranging between October 23 and November 27, with each lowest quotation represented as a percentage of the corresponding highest point.

(3) The *recovery* on Jan. 17, 1908, a date selected because the premium on currency had then disappeared and because the January dividends had then been paid out. The degree of recovery on that date is shown for each stock in the percentage borne by its quotation to that of its lowest point, and comparison between January 1907, and January 1908, is also made by giving the latter prices as percentages of the former.

All quotations have been taken from the *Financial Chronicle*, those for Jan. 17, 1908, being an average of the quoted ranges for the day.

The two tables show that the average percentages of decline and of recovery from the respective lowest points run very closely together for both Railroads and Industrials; while the averages of prices on Jan. 17, 1908, are, within a small fraction, 26½% below the highest points of the previous year for each group. This may, perhaps, indicate that the stocks selected for the two tables are, on the whole, fairly representative of general conditions. On the other hand, it appears, not only that the average percentages of both decline and recovery have been greatest

in Industrials, but that the extreme range between highest and lowest points is also to be found in this group.

The *maximum decline* was for:—

Railroads:

Northern Pacific from 189.5 to 100.5, or 47%.

Industrials:

United States Steel common from 50.4 to 21.9, or 56.5%.

The *minimum decline* was for:—

Railroads:

Southern Pacific preferred from 118.1 to 100, or 15.3%.

Industrials:

American Sugar Refining preferred from 131 to x.106, or 19.1%.

The *maximum recovery* was for:—

Railroads:

Northern Pacific from 100.5 to 127.5, or 26.8%.

Industrials:

General Electric from 89.5 to 121.5, or 35.8%.

The *minimum recovery* was for:—

Railroads:

Southern Pacific preferred from 100 to 110.5, or 10.5%.

Industrials:

American Sugar Refining preferred from x.106 to 111, or 4.7%.

Comparing prices on Jan. 17, 1908, with the highest of a year before,—

The *greatest fall* is in:—

Railroads:

Great Northern preferred from 189.7 to 123.5, or 34.9%.

Industrials:

United States Steel common from 50.4 to 29.6, or 41.3%.

The *least fall* is in:—

Railroads:

Southern Pacific preferred from 118.1 to 110.5, or 6.4%.

Industrials:

United States Steel preferred from 107.7 to 94.0, or 12.7%.

No useful purpose can be served by attempting too close an analysis of such tables as these. However, the Industrial group is sharply divided into three categories of enterprise, dealing respectively with electricity, metals, and food, and a comparison of these may have some interest.

Electricity. During the crisis the totals of American Telephone and General Electric quotations averaged 40% below the highest points: their average recovery was 30% from the lowest; and on Jan. 17, 1908, they averaged 22% below prices of a year before. Of the two General Electric showed a decline of 45% against only 34% on the part of American Telephone, but a recovery of 36% (the highest percentage of the two lists) against only 24½% in the case of the other. Finally, Jan. 17, 1908

finds American Telephone only about 18%, while General Electric was 25½% below the highest point of 1907. The contrasts are between a public service and a manufacturing corporation.

Metals. The average decline of the four stocks during the crisis was 44% and the recovery over 24%, leaving their average value on Jan. 17, 1908, lower by 30% than the highest point. But here must be noted the greatest decline in any stock of the two tables, that of United States Steel common from 50.4 in January 1907, to 21.9 on October 23, amounting to 56½%. This stock, however, recovered by 35% (or nearly as much as General Electric), leaving its value on Jan. 17, 1908, still 41% below the highest point. United States Steel preferred had a narrower range, declining only by 26½%, and recovering by 19% to a value only 12½% below that of a year before. American Smelting and Refining preferred fell 30%, and recovered over 14%, with a value on Jan. 17, 1908, some 20% below January 1907. Calumet and Hecla declined by 46½% (15% more than American Smelting preferred), but recovered by 26% to a point 32½% below its highest quotation.

Food. The averages of this group show a decline of some 26%, a recovery of 15%, with quotations on Jan. 17, 1908, only 15½% below those of a year before. It is noteworthy that American Sugar Refining preferred shows the smallest percentages in the two lists, both of decline and of recovery, the lowest quotations being only 19.1% below those of January 1907, with a recovery of only 4.7%. The fluctuations of Swift & Co. stock were more pronounced, the decline being to a point 33½% below the highest, and the recovery 29½%; while its quotations on Jan. 17, 1908, were about 1½% nearer those of a year before than American Sugar Refining preferred.

In the Industrial Stocks, then, as was to be expected, we find the greatest fluctuations and the least average recovery in the metal section, with iron and copper as the dominant factors. The electric section has not suffered so much, while the companies representing food—the two greatest food "trusts"—have lost less ground than the others.

As will have been seen, nothing more has been attempted in these notes than to record the lowest quotations and the degree of recovery for a few well-known stocks during the régime of "clearing-house certificates"; that is, for the two months when cash payments were partially suspended by the banks. But each reader must be left to gauge for himself the significance of these figures, as well as of the distinct set-back in stock prices since the 17th of January last. It must be remembered that I have dealt with only one phase of a still enduring crisis, and that no one can yet say how much longer its liquidation may last. For among the forces at work there are some whose energy must elude forecast and statistical measurement, because they are psychological rather than economic.

COURSE OF NEW YORK STOCK EXCHANGE QUOTATIONS (FROM THE "FINANCIAL CHRONICLE").

Corporations.	Highest.		Lowest.			Recovery, Jan. 17, 1908.		
	Dates, 1907.	Quotations.	Dates, 1907.	Quotations.	Percentages of Highest Prices.	Quotations.	Percentages of Lowest Prices during Crisis.	Percentages of Highest Prices in 1907.
TABLE A. *Railroads:*								
Pennsylvania	Jan. 8	141.4	Nov. 4	x.103.5	73.2	115.6	111.7	81.8
Illinois Central	" 3	172	" 16	116	67.4	132.1	113.9	76.8
Chicago & North Western:	" 10	205	Oct. 30	126	61.5	150.9	119.7	73.6
Chicago, Milwaukee & St. Paul	" 14	157.5	Nov. 21	93.5	59.4	115.8	123.8	73.5
Great Northern preferred	" 2	189.7	Oct. 30	107.5	56.7	123.5	114.9	65.1
Northern Pacific	" 7	189.5	" 24	100.5	53.0	127.5	126.8	67.3
Southern Pacific preferred	" 14	118.1	" 24	100	84.7	110.5	110.5	93.6
Union Pacific	" 5	183	" 24	100	54.6	125.2	125.2	68.4
Totals		1,356.2		847	62.5	1,001.1	118.2	73.8
TABLE B. *Industrials:*								
American Telephone & Telegraph — Electricity.	Jan. 4	133	Oct. 30	88	66.2	109.5	124.4	82.3
General Electric — Electricity.	" 27	163	" 23	89.5	54.9	121.5	135.8	74.5
United States Steel common — Metals.	" 7	50.4	" 23	21.9	43.5	29.6	135.1	58.7
United States Steel preferred — Metals.	" 7	107.7	Nov. 20	79.1	73.4	94	118.9	87.3
American Smelting & Refining preferred — Metals.	" 7	117.4	Oct. 18	81.8	69.7	93.5	114.3	79.6
Calumet and Hecla (Boston quotations) — Metals.	Feb. 15	1,000	" 24	535	53.5	675	126.2	67.5
American Sugar Refining preferred — Food.	Jan. 2	131	Nov. 27	x.106	80.9	111	104.7	84.7
Swift & Co. (Chicago quotations) — Food.	" 16	113.5	" 4	75.5	66.5	97.7	129.4	86.1
Totals		1,816		1,076.8	59.3	1,331.8	123.7	73.3

TEN YEARS OF THE INDETERMINATE SENTENCE.

By Amos W. Butler, Secretary, Board of State Charities of Indiana.

Ten years ago last April Indiana enacted the indeterminate sentence and parole laws. The same legislature converted the State Prison South at Jeffersonville into the Indiana Reformatory and named the prison at Michigan City the Indiana State Prison. These laws applied to both institutions, and were afterwards extended to apply to the Indiana Woman's Prison at Indianapolis.

In 1898 the indeterminate sentence and parole laws were attacked in the courts as unconstitutional, but were upheld by the Supreme Court of the State. This has been the decision of the courts of last resort in all the other States in which a similar question had been raised except Michigan. In that State the laws were held to be unconstitutional, but the constitution of the State was later amended and the laws were re-enacted.

There was considerable opposition to these laws in Indiana. Most of our people were uninformed concerning them. They have been so wisely administered by the authorities charged with that responsible duty, however, that those who have become acquainted with their operations are now generally favorable to them. When one compares the old prison system with the new, the advantage to the State and the far greater benefit to the prisoners from the operation of these laws, who can say they are not a distinct gain for the Commonwealth?

The Governor of Indiana, J. Frank Hanly, has made an interesting admission regarding his attitude toward the indeterminate sentence law. As a lawyer, he was opposed to it. He thought it a mistake. When he entered upon his duties as governor, he was prejudiced against it, and intended to attack it when opportunity offered. His new office brought him into close contact with both the parole boards and the prisoners, and gave him an excellent opportunity to study the administration of the law and the results obtained. His complete conversion followed. As he himself has put it: "My past prejudices are broken down. Instead of its critic, I have become its defender. I have been convinced by what I have seen and heard and learned." This he declared publicly at the Indiana State Conference of Charities at Muncie, Oct. 7, 1906, and at the meeting of the National Prison Association at Chicago, Sept. 16, 1907.

Nor is Governor Hanly alone in his conversion. At the beginning the lawyers generally regarded the laws unfavorably. Gradually they have changed their views, and when a committee of the Indiana State Bar Association, appointed a year ago to study this question, presented a favorable report at the Association's meeting in Indianapolis in July, 1907, the report was received without adverse criticism.

During the past year an attempt has been made to learn how these laws are regarded from another standpoint. Letters were addressed to a number of paroled men and to their employers, requesting their candid opinion. The result was gratifying. While a number of employers had found the paroled prisoners unsatisfactory workmen, the majority expressed themselves as well satisfied, and many declared emphatically their belief in the value of the laws. Equally pleasing were the answers received from the men. The prevailing idea seems to have been expressed by one who wrote: "I think the indeterminate sentence law a much better law both for the unfortunate boy and the citizens of the State. It gives the first offender a chance to retrace his steps before it is too late."

These laws give the prison authorities an opportunity to release men who are deemed capable of becoming law-abiding citizens, and to retain for a longer period those who have not shown satisfactory evidence of reformation. In actual practice this has resulted in considerably lengthening the average time of service in prison. A study of the records of the State Prison has brought out the fact that the last three hundred men received under the old definite form of sentence served an average of 1 year, 9 months, and 14 days. The first three hundred received under the indeterminate sentence law served an average of 3 years, 2 months, and 12 days, or 1 year, 4 months, and 28 days longer. A similar study of the Reformatory records discloses an average sentence of 1 year, 8 months, and 22 days under the old law, 2 years, 4 months, and 6 days, or 7 months and 14 days longer, under the new. When it is understood that this increase is due largely to the longer time served by men convicted of such crimes as incest and rape, the figures have an added significance.

Most of us do not realize that there have been released in Indiana upon parole, after much training, from both the Reformatory and State Prison, 3,745 men in the past ten years. Of these but 25 per cent. proved to be unsatisfactory. Most of these paroled men were unemployed when their offences were committed. They had generally not been regular wage-earners. Hence it is interesting to learn that during the time they have been tested on parole they have earned for themselves $949,773.31.

The following figures show some of the results of the operation of these laws from the time they went into effect, April 1, 1897, to April 1, 1907:—

	State Prison.	Reformatory.	Total.
Total number paroled	1,402	2,343	3,745
Received final discharge	831	1,253	2,084
Time expired while on parole	92	201	293
Returned for violation of parole	218	325	543
Delinquent and at large	114	309	423
Died on parole	29	48	77
At present reporting	118	207	325
Percentage of unsatisfactory cases	23.6	27.1	25.8

	State Prison.	Reformatory.	Total.
Total earnings of the paroled men	$380,771.49	$569,001.82	$949,773.31
Their expenses	275,964.18	486,463.50	762,427.68
Balance	$104,807.31	$82,538.32	$187,345.63

In Indiana now the indeterminate sentence law applies to all her prisons,—the Reformatory, the State Prison for men and the Woman's Prison. Minors are released from the reform schools (the Indiana Boys' School and the Indiana Girls' School) upon parole. Probation laws apply to both adults and minors. The juvenile court law applies throughout the entire State.

COMMUNICATION.

NEW YORK, Feb. 14, 1908.

TO THE COMMITTEE ON PUBLICATION OF THE AMERICAN STATISTICAL ASSOCIATION:

Gentlemen,—In sending out reprints of the June number of the Publications of your Association, the New York Committee on Physical Welfare of School Children is enclosing a slip of errata and addenda. We assume that you will not wish to call attention to typographical errors, most of which were fortunately so manifest as not to mislead. We hope, however, you will agree with us that it is worth while to give members of the Association, as well as the general reader, a brief summary of the criticisms received by us relative to the Report.

The most serious criticism referred to the first two of the twenty significant facts (p. 296).

1. *The statement that, if New York school children are typical of school children in the United States, there must be* 12,000,000 *such children having physical defects more or less serious, is not based on the Committee's study of* 1,400 *children.*

This criticism we must admit. We should have indicated that this finding was based on the records of the Board of Health which showed that, out of 165,000 children examined, two-thirds had physical defects. If this proportion should be maintained, the number of children in the United States having physical defects would be 12,000,000.

2. *The statement that, if the* 1,400 *children studied are representative of children in New York City and the United States, there must be in New York City* 41,600 *suffering from malnutrition,* 182,000 *from enlarged glands, etc., etc., is misleading.*

We admit that it would have been better to indicate clearly, what we supposed would have been evident, that this was a comparison between defectives intended only to indicate the ratios between such defects.

We recognize the danger of dogmatic statements regarding 18,000,000 children based upon the examination of 165,000 by the New York Board of Health and investigation of the home conditions of 1,400 school children. Nevertheless, as it was the aim of the Committee to call attention to the importance of the physical care of school children, as the records of the Board of Health showed that two-thirds of all children examined had physical defects, and as investigations made by the Committee into the home conditions of 1,400 school children proved that physical defects

were not confined to children of marginal incomes, it seemed permissible by the most rigid requirements of statistical methods to emphasize the extent of physical defects by the method here adopted.

The hypothetical character of the estimates was indicated by beginning the two propositions with "if," but it would have been better to place them under a more appropriate heading. Those who are sincerely interested in the problem, however, will recognize that these estimates, whether literally correct or not, point to a significant fact for the more accurate definition of which no other data exist than those we have presented. Even if 12,000,000 should ultimately prove to be an overestimate, the emphasis which it places upon the importance of physical examination and care of school children in all parts of the nation will hardly be regarded as extravagant.

Other criticisms, with the Committee's comments on them, are as follows:—

3. *The tables contain much material the meaning of which is not presented editorially.*

This we recognized when the Report was published. It was felt, however, worth while for future use by students to present all of the material. The Committee's first purpose was to throw light on a practical programme for school hygiene, and not to make a statistical study. Our tabulation and comparison stop with those facts that bear upon the question: Shall physical defects be corrected by school meals and free eyeglasses, or by physical examination at school and treatment of causal conditions at home, on the street, and at school?

4. *The practical conclusions contain matter not directly related to the tables.*

The Committee stated specifically (p. 300) that in formulating its conclusions it relied not only on the tables, but upon the Committee's experience of the past year, which included the study of literature bearing upon the subject, frequent conferences with physicians, school officials, social workers, etc.

5. *Mr. John Spargo's attitude toward free meals was misrepresented.*

We are informed that Mr. Spargo regards school meals as merely a makeshift; that he would have them free only for those unable to pay; and that he strongly urges a comprehensive programme for the study of home and school conditions that cause or aggravate physical defects.

6. *"Paying over 25 per cent. rent" should not be included under "unfavorable housing conditions."*

So far as present knowledge permits judgment, social workers and philanthropists are proceeding on the assumption that the paying of over one-quarter of the income for rent may reduce the amount available for

food, clothing, and heat, with more immediate injurious results than even a dark room or absence of bath.

7. *Income groups* $10–$15, $16–$19 *are not so fair for purposes of comparison as would be* $10–$14 *and* $15–$19.

The only use made of these income groups is to point out that physical defects are found among all of them, and that defective home environment is common to all. No attempt is made to compare group with group except in a summary table (XXXVII.), which we printed merely for the purpose of laying all the facts before students who might wish to compare group with group. Table XXV. gives the units upon which Table XXXVII. is based.

8. *Income units vary,* being one dollar for incomes under $10; two dollars for incomes over $10 and under $40; five dollars for incomes over $40 and under $50; twenty-five dollars for incomes over $50 and under $100.

These divisions were made because they best served the purpose of the Committee's study. No practical and no statistical purpose could be served by reporting incomes by dollar units where the weekly return is over forty dollars. There was no way of knowing in advance that important differences would not show between the $5 and the $6 group, or between the $10 and $11 groups. The $1 unit was used for all cards up to $25. In tabulating, it was seen that no useful purpose would be served by separating $11 from $10 and $13 from $12. The only reason that Table XXV. giving the two groups was published was to make available material for later statistical inquiry.

9. *The term "per cent. distribution" in Table XXXVII. is not clear.*

This we regret. While our 20 significant facts and 15 practical conclusions were intended to show that physical defects were common to all income groups, and that, therefore, remedies must reach causal conditions among all income groups, we realize that, given equal care, children of lowest income groups are more likely to have physical defects and home handicaps than children of adequate income groups. 100 seemed the best common denominator available. We therefore set up a consolidated comparative table that would show whether or not the proportion of defects and unfavorable conditions was higher or lower in a given income group than its proportion to total families. By failing to separate from the general table the two summary columns $10 to $19 and $20 to $29, and by failing to set up a final 100 per cent. column, by which to check additions of the six income groups, we failed to make the most out of this table. Nevertheless, the table brings out certain significant facts. For instance, it shows that, while among 1,400 families visited only 8.4 per cent. had weekly incomes less than $10, this same small group con-

tained 13.8 per cent. of the malnutrition, 9.6 per cent. of the defective breathing, 10.3 per cent. of the families losing children, and 8.6 per cent of those paying over 25 per cent. of their income for rent. It is also interesting and suggestive to note that, while families having an income of over $30 a week are but 15.6 per cent. of the total families, they include 27.6 per cent. of those who pay over 25 per cent. of their income for rent.

Permit us to express our appreciation of the service rendered by the American Statistical Association in presenting at a time of growing public interest in school hygiene this study of the home conditions of school children suffering from physical defects.

COMMITTEE ON PHYSICAL WELFARE OF SCHOOL CHILDREN.

NOTES AND REVIEWS.

NOTE ON PROPOSED RULES OF STATISTICAL PRACTICE.

The last issue of the Publications contained (page 523) some proposed resolutions relating to the practical collection and compilation of vital statistics, the purpose and scope of which may not be entirely clear without some knowledge of the character and organization of the body to which they were presented; namely, the newly organized Section on Vital Statistics of the American Public Health Association.

As indicated in the Publications, the proposed rules formed an Appendix (Appendix C) of a paper, from which is extracted the following explanatory statement:—

Third, and last, of our most pressing general requirements would seem to be the establishment of uniform Rules of Statistical Practice, which should be carefully formulated, supported by evidence of their necessity, carefully considered by the special committees of reference and by the registration offices which are to carry them out, and when finally *adopted* under the auspices of this Section and of the American Public Health Association, *then they should be strictly complied with* by all of the registration offices of the United States. Otherwise, practical uniformity and comparability of vital statistics will be quite out of the question. Every safeguard should be employed against hasty or ill-considered judgment, but, once settled, a Rule of Statistical Practice should govern absolutely until repealed. As examples of some questions on which we should legislate, some proposed resolutions are submitted (Appendix C) on the following subjects:—

1. Statement of cause of death.
2. Statement of occupation.
3. Statistical definition of deaths.
4. Statistical definition of stillbirths.
5. Statistical definition of births.
6. Essential requirements for registration of deaths (reindorsement).
7. Essential requirements for registration of births.
8. Method of testing accuracy of registration of deaths.
9. Method of testing accuracy of registration of births.
10. Constitution of standard tables of vital statistics.
11. Adoption of uniform age-periods in mortality statistics.

These proposed rules, together with those that may be suggested by other members of this Section, will probably afford sufficient material for committee work during the ensuing year. By keeping an accurate record of the decisions upon all propositions, whether *pro* or *con*, we shall

soon have a valuable code of statistical procedure to guide our action, and will know as well what has not been approved and so avoid statistical byways leading to confusion.

The resolutions are now under consideration by the various committees of the Section on Vital Statistics, and their recommendations for action in regard to some or all of the propositions may be submitted at the next annual meeting of the Association at Winnipeg, Manitoba, August,* 1908. Suggestions or recommendation relating to the subjects covered, or to other matters of statistical practice, will be warmly welcomed from members of the American Statistical Association and from all others interested. They may be sent to Dr. Wilmer R. Batt, State Registrar, Harrisburg, Pa., who is Secretary of the Section on Vital Statistics, and who will refer them to the appropriate committees.

CRESSY L. WILBUR.

MUNICIPAL STATISTICS.

Statistical Summary of the City of Buenos Ayres. By Albert B. Martinez, Director of Municipal Statistics, 1906.

This report is the sixteenth of its kind, the bureau of municipal statistics of Buenos Ayres having been established in 1881 by Dr. Emilio R. Coni. The present volume contains an introduction of 55 pages and the main part of the work 352 pages. The introductory part is of value to all students of vital statistics, as it contains up-to-date international comparisons of birth, marriage, and death rates. These latter distinguish the mortality of children under one year of age. There is also an international comparison of eleven infectious-contagious and other causes of death on the basis of ratios of the specified causes to all causes.

Some of the facts presented in the statistical summaries are of quite exceptional interest, and are seldom, if ever, found in the municipal reports of the cities of the United States. Under climatology, the barometric pressures; temperature and relative humidity; and the psychometer readings, dry and moist, are given for three daily readings,—7 A.M., 2 P.M., and 9 P.M.,—the averages being given for every ten days or as nearly as this is possible, to give three averages for each month. The rainfall and average velocity of winds are also given for the thirty-six divisions of the year. The heliometric observations are presented for each month, and include the hours that the sun was above the horizon, the hours that it was visible in the morning and in the afternoon, and the number of cloudy hours. The atmosphere is chemically analyzed for ozone, during the day and during the night, for carbonic acid, and for organic ammonia. Finally,

* The exact date of the meeting is not yet determined.

the air is bacteriologically analyzed for bacteria and what is called "mustiness." The results of the chemical analyses are averaged by months, but the bacteriological results are expressed in periods of from three to eight days' duration of bacteria growths from samples of air taken near the first and middle of each month.

Of other more or less unique statistics, mention may be made of the statistics of race tracks, or, as they are locally called, "hippodromes." These tables show, among other facts, the amount of money wagered on the horses. They show that race-track gambling has rapidly increased in Buenos Ayres, and during 1906 over $49,000,000 was wagered at the "hippodromes," or an average of nearly $50 per capita for the city's total population. Theatre statistics, financial statistics of the National Charitable Lottery, strike statistics, and returns of the Sick Fund Societies are included in other tables of more than local interest.

Under the heading "demography" there are some valuable statistics of births, marriages, and deaths. Births are returned as legitimate, illegitimate, and still-born, though the latter are not considered true births. Twin and triplet births are separately tabulated, as are also the illegitimate births legitimatized by declaration of one or both parents. The legitimate children are classified by nationality of mothers and order of birth. This table shows, for example, that in 1906 two Italian mothers gave birth to the twentieth child. The order of birth is also tabulated by ages of the mothers. In 1906 there were 1,996 children born of mothers under twenty years of age and five children born of mothers over fifty years of age. Of the former number, 1,467 were first births, 424 second, 74 third, 4 fourth, 4 fifth, and 2 sixth; while of the latter one was a second child, one a sixth, one a seventh, one an eighth, and one a twelfth.

The marriage statistics are given in less detail than the births, and are principally interesting because of the ages. The most popular age for marriage is under twenty for girls. About one-third of the young men marry at ages 21–25 and another third at ages 26–30.

The mortality statistics occupy thirty-eight pages of the volume, and the tabulations are in many respects admirable. The crude death-rate of Buenos Ayres has declined from 27.2 per 1,000 in 1888 to 16.5 in 1906. The rate was highest (30.0) in 1890 and lowest (15.5) in 1905. Tuberculosis seems to have been somewhat more fatal to the native Argentines than to persons from outside of the Republic. During 1902–06, among those of Argentine birth of ages fifteen and over, 28.5 per cent. of the deaths from all causes were from tuberculosis as against only 14.3 per cent. for persons from outside of the Republic.

The mortality of children is an important subject admirably treated in these statistics of Buenos Ayres. Although the divisional periods of life at ages under five are not given in the detail available in the statistics of

Berlin, Germany, where they are given for single months for the first two years of life, they are better than are to be found in most of our American cities. The age periods for deaths under five years of age are: 1 to 30 days, 1 to 6 months, 6 to 12 months, 1 to 2 years, 2 to 3 years, 3 to 4 years, and 4 to 5 years.

The death rates per 1,000 born and surviving are calculated by single years of life per ages 0–4 for each of the seventeen years 1890–1906. The following condensed comparisons indicate a notable improvement in the mortality of children in Buenos Ayres during that period:—

DEATH-RATES OF CHILDREN PER 1,000 BORN AND SURVIVING, BUENOS AYRES, 1890–1906.

Ages (years).	1890.	1895.	1900.	1906.
0–1	176.9	132.5	123.5	102.3
1–2	92.3	84.1	61.8	40.4
2–3	54.9	41.7	25.5	17.2
3–4	45.4	34.8	20.9	10.4
4–5	43.0	23.3	13.3	6.0

The following table shows the death-rates per 1,000 of those born and surviving under two years of age for certain causes and per 1,000 of those born and surviving under one year of age for three causes:—

DEATH-RATES OF CHILDREN PER 1,000 BORN AND SURVIVING, BUENOS AYRES.

Causes of Death.	Ages under two years.			
	1890.	1895.	1900.	1906.
Diphtheria and Croup	7.1	2.0	1.6	0.5
Whooping-cough	1.2	0.7	0.7	0.7
Tuberculosis	1.3	1.4	1.8	1.3
Meningitis	11.2	14.5	8.6	9.2
Diarrhœa	36.9	31.4	29.1	23.1
Respiratory Diseases	28.0	26.6	24.9	19.0
	Ages under one year.			
Tetanus	12.4	8.4	8.4	2.8
Convulsions	4.3	3.8	2.1	1.6
Congenital Debility	17.2	12.0	12.5	9.5

These abbreviated tables indicate very clearly that the improvement in the infantile mortality in Buenos Ayres has been largely due to two factors,—better general care of children and better medical treatment.

A valuable summary table gives the death-rates per 10,000 of population from the principal causes of death for each of the twenty years 1887–1906. The heading to this table contains a curious error often met with in newspapers, magazines, and, strangely enough, even in official statistical publications. The heading reads as follows: "Total Deaths in the City, from Several Diseases, of the Last Twenty Years for Each 10,000 Inhabitants, showing Percentage of Each Disease." To say percentage per ten thousand, or, as is more frequent, percentage per thousand, is somewhat like saying that a train runs at a speed of sixty miles per hour per minute.

Suicides are considered in a chapter which treats of criminal statistics. It is worth noting that unsuccessful attempts at suicide are recorded as well as actual suicides. During the ten years 1897–1906 there were 1,316 suicides and 1,090 attempts at suicide. The suicides are tabulated by sex, age, cause, and means employed. About 70 per cent. of the suicides were males. Women committed suicide at earlier ages than men. Family troubles caused about one-fifth of the suicides, and physical diseases one-seventh. Fire-arms were the means employed in over 42 per cent. of the cases, and poisons in over 28 per cent.

Annual Report of the Health Department of Louisville, Ky., for the year ended Aug. 31, 1907.

The value of this report for any practical purpose—sanitary or other—is seriously impaired by the failure to separate the white and colored deaths, except in the aggregate. Approximately one-fifth, or 20 per cent., of the total population of Louisville is colored. The total population of the city is about 250,000, of which nearly 50,000 are negroes. The crude death-rate of the colored population during the year ended Aug. 31, 1907, was 23.3 per 1,000 of population against a rate of only 16.4 for the white population.

Consumption caused 490 deaths during the year, a larger number than was charged to any other specific cause. The report, however, does not indicate what proportion of these deaths occurred among the white and colored elements of the population. For comparative or other sanitary purposes it would seem to the writer that a clear and sharp distinction should always be made between the vital statistics of the white and colored populations of a city whenever or wherever the colored element forms as much as 10 per cent. of the total population. All the known facts indicate that the crude death-rates of negroes are about 50 per cent. in excess of the crude death-rate of the white populations in both the North and South. Further, it is a well-known fact that the excess of mortality among the negroes is principally

due to a few well-defined causes, of which consumption is one of the most prominent. Unless, therefore, the vital statistics of the two races are carefully distinguished, some of the most useful facts are lost sight of and some of the most valuable sanitary and health lessons are not taught by the health reports.

F. S. CRUM.

IMPROVEMENT OF VITAL STATISTICS.

Registration of Deaths. Including a paper on "The Essential Requirements of a Law for the Registration of Deaths and the Collection of Mortality Statistics," prepared by the Committee on Demography of the American Public Health Association. (Circular.) United States Census Office, No. 71, pp. 10.

Practical Registration Methods. Information for local registrars as to the standard certificate, forms of records, and indefinite causes of death reported by physicians. United States Census Office, 1903, No. 101, pp. 28.

Relation of Physicians to Mortality Statistics. The international classification of causes of death as adopted by the United States Census Office and approved by the American Public Health Association. United States Census Office, 1903, No. 102, pp. 26.

Registration of Births and Deaths. Drafts of laws and forms of certificates. Bureau of the Census, No. 104, pp. 31.

Statistical Treatment of Causes of Death. Co-operative work relative to treatment of jointly returned causes and the revision of the international classification. Bureau of the Census, No. 105, pp. 19.

Extension of the Registration Area for Births and Deaths. A practical example of co-operative census methods as applied to the State of Pennsylvania. Bureau of the Census, No. 106, pp. 51.

Modes of Statement of Cause of Death and Duration of Illness upon Certificates of Death. Comparison of forms now in use in the United States and certain other countries, and suggestions of a modification of the standard certificate of death in order to secure uniform and definite statements of causes of death. Check-list of registration officials, reports, and bulletins. Bureau of the Census, No. 107, pp. 81.

The first three of these pamphlets were issued by the Division of Vital Statistics under the direction of Mr. W. A. King, former chief statistician for vital statistics. The last four were more recently published under the direction of the present chief, Dr. Cressy L. Wilbur. Together they give abundant evidence of the vigorous efforts of the federal government

to improve the quality of the vital statistics of the United States. The Census Office at the present time does not make any independent effort to collect statistics of births and deaths. Its statistics are based upon the returns of local and State offices in the so-called registration area, and obviously its work is affected by the quality of local registration. One of the greatest defects is lack of uniformity of procedure in the several States, and it is the endeavor of the Census Office to remedy this defect. These pamphlets represent a campaign of education along this line, and give hopeful promise of great improvement in the future.

The last in this series, No. 107, is by far the most important. It includes an account of the methods of reporting causes of death and duration of illness in the United States. A copy is given of the standard certificate of death which is followed at the present time in eight States and in twenty-one cities outside of the given States. Copies are also given of "modified standard certificates of death." The practice of foreign countries is also detailed. Interesting comments are added on the terminology of terms employed on certificates of death to denote cause of death. Illustrations are also given showing the confusion which arises from the inexact use of "causes." This pamphlet closes with a check list of registration of officials and a record of the health bulletins issued by the several State and municipal offices.

THE LIMITATIONS OF STATISTICS.

William H. Allen, in his "Efficient Democracy," has written an Epistle to the Gentiles preaching a new gospel of the statistical method as a guide to life. He tells us that goodness is nothing without efficiency, and that efficiency finds its firm foundation in the statistical method. Just plain goodness is not enough: one must be "good for something," and this "something" is purely objective and may be counted, weighed, and tested; and efficiency develops goodness, as the time-clock and the cash register develop habits of punctuality and honesty.

And Dr. Allen, in the true evangelistic spirit, will not allow this way of holiness to remain the esoteric possession of a statistical priesthood. He goes forth to preach the statistical gospel to "every man." He tells us, indeed, that, like M. Jourdain in another field of human knowledge, we all have been more or less unconscious statisticians all our lives. We are told that, when we are conducting the ordinary operations of reasoning, we are statisticians; that the scientist reaches his result by "statistics"; that business method is practically the statistical method; and that the carpenter and plumber are quite as "statistical" as the political

scientist. It is not difficult to see the extravagance of these propositions; but we may perhaps forgive them, for they give the necessary heat and impetus that propel the apostle in his very useful social task of trying a big experiment for us.

Dr. Allen's book is not merely the exposition of an abstract theory, but a record of beginnings at least of the application of that theory in practice, along the lines of a great and vital need in modern communities. And, as such, the book is exceedingly valuable and stimulating. Whether we do or do not accept Dr. Allen's theory of the universal applicability of the statistical method, it is becoming increasingly plain that our affairs, in modern communities, are growing beyond our grasp or our means of dealing with them directly and personally. The statistical method is a means of dealing with such larger affairs; that is, its essence consists, in the case of numbers of instances too large to be grasped by the unassisted observation, in translating our individual qualitative judgments into quantitative terms, to reduce them again to the new qualitative judgment we are after. This method at best is a mechanical means, and gives us a nearer or farther approximation to the truth. It has its own limit and function, which any elementary text-book on statistics will indicate; but in the more complicated affairs of life we are compelled to have recourse to it. And, as the application of this method; is more or less sporadic at present, every new attempt that adds to our knowledge of its limitations and to the development of its capabilities is of the greatest social value.

Dr. Allen has had the great good fortune to be intimately concerned with one enterprise after another, undertaken with the object of shedding more light on dark places, and has had the great satisfaction of seeing one institutional skeleton after another rattle its dry bones with terror and the thrill of coming life. And, as at the time of writing the book most of the enterprises were in that cheerful early stage in which promise is greater than performance, the author's enthusiasm is not as yet dampened by the disappointments that will surely come, as experience reveals the limitations of his method.

The record of accomplishment so far, however, is a highly creditable one. More light has been turned on the hospitals, the organized systems of relief, and the complicated affairs of the municipality in its various aspects, as the schools, the parks, the care of the public health, and the administration of the public finances.

In the case of the New York City hospitals, for instance, a falling off of revenues and increase of debt having directed attention to their business management, it was found that the greatest disorder, obscurity, and actual lack of information characterized their records and reports, so that neither their managers nor the public knew either the cost or the

services rendered in return for cost of these enterprises. As a result of these discoveries, a schedule of uniform accounting and reporting was drawn up by a committee, adopted by the four leading hospitals of New York City in 1906, and endorsed in 1907 by a permanent hospital conference.

In the public schools, where great masses of heterogeneous human material are thrown upon the educational threshing-floor, and where the old rules fail, derived from small schools and a homogeneous, home-trained population, a record-card has been introduced, giving information as to the physical condition of each child. On the basis of this card one-sixth of the 600,000 school children of New York were examined, with results pointing clearly to definite needs in the school system. A private Committee on the Physical Welfare of School Children has been organized to carry the investigation farther into the home conditions, with a view to the improvement of these as well. Another help to the schools was the improved school census undertaken by New York City in 1906, of which Dr. Allen gives the schedule in his book.

Perhaps the most generally interesting of the various enterprises undertaken are those involving the application of the statistical method to public affairs. The duty of the citizen is one of those general duties that seems of indirect concern to the individual, yet is of the most direct concern. And yet, even when he is aroused to it, how helpless he feels in trying to cope with these mixed-up affairs so far out of reach! How many attempts at "reform" have failed because, as Dr. Allen well puts it, the leaders of public opinion have not realized that "publicity and reform have their technique as well as business and law"!

The transactions of the New York municipality, as of other municipalities, are recorded and reported in such a way that the average citizen cannot have any clear idea of what is going on,—whether his "good" appointees are really doing good work, whether his "bad" appointees are really as worthless as the campaign orator depicts them. The present comptroller of the city of New York has said that "the existing method of keeping the city's accounts serves only to conceal the facts." In his own office it had been the practice of the department to make up records for private title companies, while the city records on the same subject were years behind, so that, when the city required the information in question, it had to go to the title companies for it. Some one else said, in regard to the work of the city, "It is impossible to get information unless the seeker himself turns book-keeper."

To quote Dr. Allen on the situation: "An educational budget of $25,000,000 is voted without school or fiscal authorities knowing what expenses were incurred the preceding year, the number of pupils that benefited, or the work contemplated for next year. There is a difference

of $50,000,000 between the mayor's guess and the comptroller's guess as to the city's borrowing power not yet used. Department heads ask for 25 per cent. to 100 per cent. more than they need, estimates for unpopular purposes are shrunk, water is put in the requests for purposes favored by the fiscal board, and then later in the year the surplus in popular is transferred to unpopular purposes without due knowledge or consideration. Although this happens year after year and although reports might be made to show the fact, fiscal authorities go on voting without knowledge as to what actually became of moneys voted last year. Supplementary appropriations, like transfers, do not enter into budget-making. Imaginative assistants guess what the departments need, the board of estimate and apportionment guesses what they can do without. Reports are published too late to be read, *sans* units of inquiry, *sans* subtraction, *sans* percentages or classification. No one learns anything from them. No one would pretend to base method or policy upon them."

A "Bureau of City Betterment" made an effort toward bringing practical statistical help to the operations of government by presenting to the board of estimate a classified statement of the work of the Department of Health, as a basis for a budget. The immediate result was an increase of $100,000 for school inspection, a health budget showing work planned, with its funds segregated to insure the execution of the plan, and instructions by the board of estimate to all departments to submit budgets for 1908 in such shape as to show the work done in 1907 and the work contemplated for 1908.

In continuation of this story the New York *Times* for Oct. 3, 1907, states that "Mayor McClellan, Mr. Metz, and the other gentlemen who preside over the apportionment of the city budget were gratified by the exceptionally clear estimates of the future needs of the Board of Health furnished yesterday by Dr. Darlington. They were so described and so detailed that the board could consider them intelligently and the tax-payers would know what they were expending their money for. The credit for this striking achievement belongs not only to the head of the Health Board, but to the Conference Committee of Comptroller Metz's department and to the Bureau of Municipal Research, whose recommendations Dr. Darlington adopted."

The Bureau of Municipal Research above referred to is perhaps the most interesting and important recent realization of the application of statistics to life. This is an outgrowth of the "Bureau of City Betterment" of the Citizens' Union, but quite independent of any political organization for obvious reasons, to secure greater effectiveness. The work of such a bureau was already outlined in Dr. Allen's book before the bureau itself was established. As there outlined, it would deal with

such matters as the analysis of annual budgets, examination of departmental reports from the standpoint of the tax-payers' interest in the accomplishment of results, critical study of the finance department's attempts to give publicity, scientific study of the framework of the city government, as, for instance, in charter provisions, organization of departments and methods of control, minute analysis of facts regarding different departments, organization, expense, results obtained and methods of presenting results—education, health, parks, docks, board of aldermen, borough president, board of estimate, comptroller's office, mayor's office; examination of facts regarding the city debt and franchises; extent and cause of remediable conditions that indicate governmental responsibility for the physical deterioration of children, for pauperism, for crime, for preventable disease, etc.

It is perhaps a mark of the apostle that Dr. Allen seems to think not only that his statistical gospel is needed by every man, but that it is brand-new; that is, in conscious acceptance. And so he seemed to regard this bureau as a somewhat unique enterprise. He certainly says definitely (p. ix.) that "at present there is *no* mechanism for learning and publishing the facts of social life and public administration." He seems to have forgotten for the time being such institutions as the Federal Census, with its various detailed investigations; or the Boston Department of Statistics, founded to do a work similar to that of the New York Bureau or the National Municipal League, which has interested itself especially in municipal accounting and recommended a scheme which has been approved and utilized by the Federal Census Bureau and by upwards of eighty cities.

But it may perhaps be said that the New York Bureau is trying the experiment of statistical research as a direct aid to governmental efficiency on a larger scale and under more favorable circumstances than it has been tried before, and from it most valuable results are sure to be gained, in experience of limitations as well as in positive achievement. Indeed, if Dr. Allen will write us another book at the end of ten years, telling us fully and frankly the outcome of the various experiments of that bureau and the other enterprises undertaken along the lines indicated in the first book, we shall have a couple of volumes forming a noteworthy contribution to the literature of statistics.

Is it too early to forecast some of the results of that and similar experiences? In the first place, the present rage for putting every conceivable thing in the shape of "statistics" and beginning every enterprise of any sort whatever with a long and elaborate and costly research will probably have subsided. Just now much of what is produced as "statistics" appears a laborious attempt to prove, by figures, what was sufficiently well known before to any one with a fair amount of common

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sense. Is there typhoid fever in Pittsburg? There is no need of elaborate statistical apparatus to point out the evil and the remedy. There is no occasion for showing in detail the cost to the community through the families afflicted,—their wages, rents, household budgets, ancestry, or what not. The evil is seen in ten minutes' scrutiny of the bare record of cases and deaths: the remedy is abundantly known to every physician and every intelligent layman. What is needed in such cases is not a Galileo, but a Peter the Hermit.

Great practical difficulties are certain to arise in the application of the statistical method, even where the great complication of affairs makes it necessary, to miscellaneous masses of concrete fact. Dr. Allen lays proper emphasis on the necessity of finding a countable unit, but he altogether too cheerfully assumes that for every intelligent question there can be found "a statistical answer" (p. 27–28). It would be difficult, we think, to find the unit for a large proportion of the questions Dr. Allen himself asks in the long lists shown in his book. And even the sample schedules given by him show more than one question to be answered by "bad" or "good," or some other term not verifiable by an objective, definite standard. The results of the physical examination of school children, for example, have already been made use of by agitators, on the basis of such ambiguous terms as "need" of medical or surgcial attention, "bad" digestion, "mal"-nutrition.

Another practical difficulty will be in securing original records which will show the units desired. This is at the bottom of half the trouble about adequate statistics, that no daily record has been kept of things we want to know. And it is difficult, even where there is a desire to do this, to anticipate the questions likely to be asked. The point of emphasis of interest changes from period to period: the daily record may be changed to answer the questions asked at a given date only to find that within a year other questions are being asked and the old questions are no longer heard. As comparison gives nine-tenths of their value to statistics, it is often necessary to choose between an old, inadequate basis of classification, allowing of comparison, and a new system, adequate for the moment, without that base of comparison.

Another practical difficulty is in the expense and effort involved. It is all very well to say that $500 is well spent in saving $1,000, but in practical statistical work it often happens that a scheme of great theoretical value in throwing light and saving cost will itself involve so much greater cost as to be impossible.

Furthermore, it has to be again recalled that the statistical aid is, after all, purely mechanical. Its usefulness depends very largely upon the "goodness" Mr. Allen puts in the background and upon intelligence in interpretation that is not always available. Any one who has worked

in statistical enterprises can readily furnish examples of this. Indeed, Mr. Allen's simple illustration of the value of statistical method affords an equally vivid illustration of its defect. Efficiency does promote goodness just about as the time-clock and cash-register promote punctuality and honesty. Any one who has ever managed an office knows that the perfunctory punctuality and honesty inculcated by the above-named devices are a poor excuse for the real thing; that the inert employee will remain inert under these checks and safeguards, and the actively ill-disposed will find ways to "beat" the machine. Yet the machine is, after all, better than nothing.

Thus with statistics. In a certain city department a commissioner was desirous of making a better record than his predecessor. In the statistical report of the department the number of orders issued was made a leading feature—on its face, a reasonable enough unit. The commissioner in question, by giving instructions to prepare the orders differently, made three out of the same material which had formerly made one, and showed a tremendously increased volume of work. Another plan resorted to was to issue orders as a result of perfunctory and worthless inspections. This also increased the volume of work done, and in this case there was no means of testing the quality. In the former case there was a means, as another tabulation of orders, on the basis of separate items attended to, showed the fallacy. But nine people out of ten, reading the report, would have failed to note the discrepancy.

This attempt to seize quality in the quantitative net is always imperfect, even under the best of circumstances. In the department referred to, units of work are necessarily employed to keep the inspectors up to a standard. Here, again, it is possible for an inspector to make good his required points by not doing his work thoroughly. There is a perpetual dispute going on between those who think the number should be so low as to permit of thorough work and those who think the number of units is of the most importance. Of course, a tendency to slight in quality of work is detected sooner or later by supervisors sent over the ground to test this. And this is not to say that cash-register methods are not necessary, but that they are cumbersome and mechanical at the best.

There are also the hindrances that arise when one set of people is trying to throw light upon and get light from another set of people. Dr. Allen has well summarized the main reasons why the production of intelligence has not been undertaken by the governing officials of large enterprises, public and private: first, fact is subordinated to expediency; second, in public life officials have been chosen for service to party rather than for fitness, or perhaps good men have been placed in office to carry out a program that a knowledge of actual conditions would have shown in

advance to be impracticable; third, officers are changed too often to discover needs and devise remedies or to develop a continuous policy.

And, lastly, it will always be difficult to get the public to use even the clearest and most carefully prepared information. For obvious psychological reasons the question, "Has any money been stolen?" will always be more vitally interesting than "Are we getting our money's worth?" After all "goodness" and "badness"—the absolute—is what takes the public eye, not the how much or how many. Nevertheless, the statistical method is the necessary machinery of the future. Like that other method of dealing with matters in gross,—the factory system,—it will never supersede the method of dealing at first hand with the concrete things, and may often follow very clumsily after; but it is necessary to supply the clamoring need of the world, which can no longer be supplied by individual effort.

KATE HOLLADAY CLAGHORN.